Nuclear ground-state masses and deformations: FRDM(2012)

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Abstract

We tabulate the atomic mass excesses and binding energies, ground-state shell-plus-pairing corrections, ground-state microscopic corrections, and nuclear ground-state deformations of 9318 nuclei ranging from 16 O to A=339. The calculations are based on the finite-range droplet macroscopic model and the folded-Yukawa single-particle microscopic model. Relative to our FRDM(1992) mass table in ATOMIC DATA AND NUCLEAR DATA TABLES [59 185 (1995)], the results are obtained in the same model, but with considerably improved treatment of deformation and fewer of the approximations that were necessary earlier, due to limitations in computer power. The more accurate execution of the model and the more extensive and more accurate experimental mass data base now available allows us to determine one additional macroscopic-model parameter, the density-symmetry coefficient L, which was not varied in the previous calculation, but set to zero. Because we now realize that the FRDM is inaccurate for some highly deformed shapes occurring in fission, because some effects are derived in terms of perturbations around a sphere, we only adjust its macroscopic parameters to ground-state masses.

The values of ten constants are determined directly from an optimization to fit ground-state masses of 2149 nuclei ranging from ^{16}O to $^{265}_{106}\text{Sg}$ and $^{264}_{108}\text{Hs}$. The error of the mass model is 0.5595 MeV for the entire region of nuclei included in the adjustment, but is only 0.3549 MeV for the region $N \ge 65$.

We also provide masses in the FRLDM, which in the more accurate treatments now has an error of 0.6618 MeV, with 0.5181 MeV for nuclei with $N \ge 65$, both somewhat larger than in the FRDM. But in contrast to the FRDM, it is suitable for studies of fission and has been extensively so applied elsewhere, with FRLDM(2002) constants. The FRLDM(2012) fits 31 fission barrier heights from 70 Se to 252 Cf with a root-mean-square deviation of 1.052 MeV.



Cont		
	INTRODUCTION	5
2.	MODELS	7
	2.1. Model error and adjustment procedure	9
	2.2. Shape parameterizations	
	2.2.1. Perturbed-spheroid parameterization	
	2.2.2. Three-quadratic-surface parameterization	
	2.2.3. Conversions to β parameters	
	2.3. Finite-range droplet model	
	2.4. Values of FRDM macroscopic-model constants	
	2.5. Finite-range liquid-drop model	
	2.6. Values of FRLDM macroscopic-model constants	
	2.7. Microscopic model	
	2.8. Microscopic pairing models	
	2.9. Effective-interaction pairing-gap models	
	2.10. Shell correction	
	2.11. Zero-point energy	
	2.12. Values of microscopic-model constants	
3.	ENUMERATION OF CONSTANTS	
	3.1. Constants in the FRDM	
	3.2. Constants in the FRLDM	
	CALCULATIONAL DETAILS	
5.	CALCULATED RESULTS	
	5.1. Extrapability	
	5.2. Detailed comparisons of masses and deformations in the FRDM(1992) and FRDM(2012)	
	5.3. Calculated ground-state masses and deformations	
	5.3.1. Do magic numbers really disappear for some exotic nuclei?	
	5.3.2. Dependence of model accuracy with nucleon number <i>A</i>	
	SOME ADDITIONAL STUDIES AND DISCUSSION	
	6.1. Can the deviations below $N \approx 65$ be decreased?	
	6.1.1. Improved choice of spin-orbit and single-particle potential diffuseness constants	
	6.1.2. Improved determination of zero-point energies	
	6.1.3. Alternative shell-plus-pairing calculation	
	6.1.4. Effect of a tensor force	
	References	63
FVD	LANATION OF TABLE	67
LAP	DAMATION OF TABLE	07
TAR	LE Calculated Nuclear Ground-State Masses and Deformations, Compared to the AME2003 Evaluation	
	e available	68
WITCH	c avanaule	00



1. INTRODUCTION

We presented our first macroscopic-microscopic global nuclear mass calculation about 35 years ago [1, 2]. That calculation, which was based on a finite-range liquid-drop model for the macroscopic energy and a folded-Yukawa single-particle potential for the microscopic corrections, was somewhat limited in scope. With only 4023 nuclei included, it did not extend to the proton or neutron drip lines or to the region of superheavy nuclei. Also, the quantities tabulated were limited to ground-state masses, Q_2 and Q_4 moments, and microscopic corrections.

Successive FRDM enhancements

Optimization (2006)

Better search for optimum FRDM parameters.

Accuracy improvement: 0.01 MeV

New mass data base (AME2003) (2006)

Better agreement than with AME1989.

Accuracy improvement: 0.04 MeV

Full 4D energy minimization (2006-2008)

Full 4D minimization(ϵ_2 , ϵ_3 , ϵ_4 , ϵ_6) step=0.01. Accuracy improvement: 0.02 MeV

Axial asymmetry (2002-2006)

Also yields correct SHE gs assignments.

Accuracy improvement: 0.01 MeV

L variation (2009–2011)

Accuracy improvement: 0.02 MeV

Improved gs correlation energies (2012)

Accuracy improvement: 0.01 MeV

Fig. 1: Successive enhancements to FRDM(1992) with $\sigma_{th} = 0.669$ MeV and their impact, leading to FRDM(2012) with $\sigma_{th} = 0.5595$ MeV. The years when the different effects were investigated are given in parentheses. These steps will be discussed in Sect. 4

Our next publication of calculated nuclear masses occurred in 1988 [3, 4]. In these calculations new pairing models had been incorporated and two different macroscopic models were investigated, namely the finite-range liquid-drop model (FRLDM) [3] and the finite-range droplet model (FRDM) [4]. These abbreviations are also used to designate the full macroscopic-microscopic nuclear structure models based on the respective macroscopic models. The former is the macroscopic model used in the 1981 [1, 2] calculations and the latter is an improved version [5] of the droplet model [6, 7, 8]. Because there were several unresolved issues in the 1988 calculations [3, 4] these tables should be regarded as interim progress reports.

Over the next few years those issues were resolved. Their resolution led to the mass tables FRDM(1992) and FRLDM(1992) [9], presenting results on nuclear ground-state masses and deformations for 8979 nuclei ranging from ¹⁶O to ³³⁹136 and extending from the proton drip line to the neutron drip line [9]. The calculation was based on the macroscopic-microscopic approach. The shell corrections were obtained from single-particle levels calculated in a folded-Yukawa single-particle potential [10] by use of the Strutinsky method [11, 12]. Residual pairing corrections were calculated in the Lipkin-Nogami approximation [13, 14, 15, 16]. Two 1992 mass tables were provided, both based on these shell-plus-pairing corrections, but with the macroscopic contribution to the total potential energy obtained in two different liquid-drop-type models, namely the finite-range droplet model, and the finite-range liquid-drop model. We refer to this previous macroscopic-microscopic mass model in which the total potential energy is calculated as a sum of shell-plus-pairing corrections from folded-Yukawa single-particle levels and a macroscopic energy term from the finite-range droplet model as FRDM(1992). The year in parentheses refers to the year the constants of the macroscopic model were determined and frozen. The potential-energy model in which the macroscopic term is given by the finite-range liquid-drop model is referred to as FRLDM(1992). Although these mass models were published in 1995, we refer to them as FRDM(1992) and FRLDM(1992), because the mass models were finalized in September 1992 and widely distributed at that time. Also, we could not predict at manuscript submission when the manuscript would appear in print.

FRLDM mass-related quantities:

Finite-range liquid-drop model microscopic correction

Finite-range liquid-drop model mass excess

Subsequent comparisons of predictions of FRDM(1992) [9] with nuclear masses measured after the calculations were published showed that the model would reliably predict masses of nuclei that were not included in the determination of model constants. In fact, with a properly defined model error, that is, a definition different from the root-mean-square error, which includes contributions from experimental errors, see Refs. [3, 9], we find that for 529 new masses in AME2003 [17] that were not known when the FRDM(1992) constants were determined, the error is only 0.462 MeV, compared to 0.669 MeV with respect to the AME1989 data base [18] used in the determination of the FRDM(1992) constants. Furthermore, there was no systematic increase in the model error with distance from β stability. It has also been established that these mass-model results agree very well with Q_{α} values observed in the decay of subsequently discovered superheavy elements [19, 20, 21, 22, 23, 24, 25, 26].

Many other nuclear-structure properties were successfully modeled, for example a special result of the 1981 mass calculation was the interpretation of certain spectroscopic results in terms of an intrinsic octupole deformation of nuclei in their ground state [1, 27, 28, 29].

We present results of our new calculations of nuclear ground-state masses and deformations, namely FRDM(2012) and FRLDM(2012). A summary description of the steps leading to the improved model are given in Fig. 1. These steps will be discussed in detail in section 4.

Because in the macroscopic-microscopic approach we calculate single-particle energies and wave functions, it is possible to calculate a large number of nuclear-structure properties in addition to nuclear ground-state masses. These include the following:

Ground-state deformation multipoles: Quadrupole ε deformation ε_2 Octupole ε deformation ϵ_3 Hexadecapole ε deformation ε_4 Hexacontatetrapole ε deformation ε_6 Related quadrupole β deformation β_2 Related octupole β deformation β_3 Related hexadecapole β deformation β_4 Related hexacontatetrapole β deformation β_6 **Beta-decay properties:** Q value of the β decay β-decay half-life P_{1n} β -delayed one-neutron emission probability P_{2n} β -delayed two-neutron emission probability β -delayed three-neutron emission probability Lipkin-Nogami pairing quantities: Neutron pairing gap Δ_n $\Delta_{\boldsymbol{p}}$ Proton pairing gap Neutron number-fluctuation constant λ_{2n} Proton number-fluctuation constant λ_{2p} **Odd-particle spins:** Projection of the odd-neutron angular momentum along the symmetry axis Ω_n Ω_{p} Projection of the odd-proton angular momentum along the symmetry axis Alpha-decay properties: Q value of the α decay Q_{α} α-decay half-life FRDM mass-related quantities: $E_{\rm mac}^{\rm sph}$ Spherical macroscopic energy Microscopic correction $E_{\rm mic}$ Calculated mass excess $M_{\rm th}$ Discrepancy ΔM Calculated binding energy B_{th}

Folded-Yukawa finite-range single-particle related quantities:

Shell correction	$E_{ m shell}$
Pairing correction	$E_{ m pair}$

Neutron and proton separation energies:

One-neutron separation energy	S_{1n}
Two-neutron separation energy	S_{2n}
Three-neutron separation energy	S_{3n}
One-proton separation energy	S_{1p}
Two-proton separation energy	$S_{ m 2p}$

As mentioned above, we present in the Table the calculated ground-state masses and deformations and some related quantities. Some of the other quantities will be published later.

In the next section we specify the macroscopic-microscopic finite-range droplet model in some detail. We repeat some of the model details found in Ref. [9] for several reasons. First, we wish to correct the very few misprints that we and our colleagues found. Second, to provide in what is probably our final nuclear mass-table publication a complete specification of the model in one location. Third, the retrievable manuscript file on the ADNDT web site of the FRDM(1992) manuscript is as of this writing of poor quality and not searchable.

We discuss in particular the constants of the model, paying special attention to how to count the number of constants of a model. We present a summary of *all* constants in the model, including both those constants that have been determined from a least-squares adjustment to ground-state masses and fission-barrier heights and those that have been determined from other considerations. In addition we count what are considered "natural constants", such as \hbar . After our model has been specified, we discuss how it has been applied in the current calculation.

2. MODELS

In the macroscopic-microscopic method the total potential energy, which is calculated as a function of shape, proton number Z, and neutron number N, is the sum of a macroscopic term and a microscopic term representing the shell-plus-pairing correction. Thus, the total nuclear potential energy can be written as

$$E_{\text{pot}}(Z, N, \text{shape}) = E_{\text{mac}}(Z, N, \text{shape}) + E_{s+p}(Z, N, \text{shape})$$
(1)

We study two alternative models for E_{mac} , given by Eqs. (40) and (62). The shell-plus-pairing correction is given by Eqs. (76) and (77).

It is practical to define an additional energy, the microscopic correction E_{mic} , which is different from the shell-plus-pairing correction E_{s+p} . For a specific deformation ε_a , the latter is determined solely from the single-particle level spectrum at this deformation by use of Strutinsky's shell-correction method [11, 12] and a pairing model. In contrast, the microscopic correction is given by

$$E_{\text{mic}}(\varepsilon_{a}) = E_{s+p}(\varepsilon_{a}) + E_{\text{mac}}(\varepsilon_{a}) - E_{\text{mac}}(\varepsilon_{\text{sphere}})$$
(2)

This definition has the desirable consequence that the potential energy E_{pot} of a nucleus at a certain deformation, for example the ground-state deformation ε_{gs} , is simply

$$E_{\text{pot}}(\varepsilon_{\text{gs}}) = E_{\text{mic}}(\varepsilon_{\text{gs}}) + E_{\text{mac}}(\varepsilon_{\text{sphere}})$$
(3)

However, the reader should note that in the literature the term microscopic correction is sometimes used instead for shell-plus-pairing correction. When results are presented it is usually $E_{\rm mic}$ that is tabulated, because it represents all additional effects over and above the *spherical* macroscopic energy. In practical calculations it is $E_{\rm s+p}$ that is calculated. To obtain the total energy a *deformed* macroscopic energy term is then added to $E_{\rm s+p}$. These concepts are illustrated in Fig. 2. There exist several different models for both the macroscopic and microscopic terms. Most of the initial studies following the advent of Strutinsky's shell-correction method used the *liquid-drop model* [30, 31] as the macroscopic model.

The preferred model in the current calculations has its origin in a 1981 nuclear mass model [1, 2], which utilized the folded-Yukawa single-particle potential developed in 1972 [10, 32]. The macroscopic model used in the 1981 calculation was a finite-range liquid-drop model, which contained a modified surface-energy term to account for the finite range of the nuclear force and the diffuseness of the nuclear surface. The modified surface-energy term was given by the Yukawa-plus-exponential finite-range model [33]. The macroscopic part in this formulation does not describe such features as nuclear compressibility and corresponding variations in the proton and neutron radii.

The droplet model [6, 7, 8], an extension of the liquid-drop model [30, 31] that includes higher-order terms in $A^{-1/3}$ and (N-Z)/A, does describe such features. However, in its original formulation the droplet model was very inaccurate for nuclei far from stability. These deficiencies led Myers to suggest that the surface-energy terms of the droplet model also be generalized to account for the finite range of the nuclear force, and to more accurately

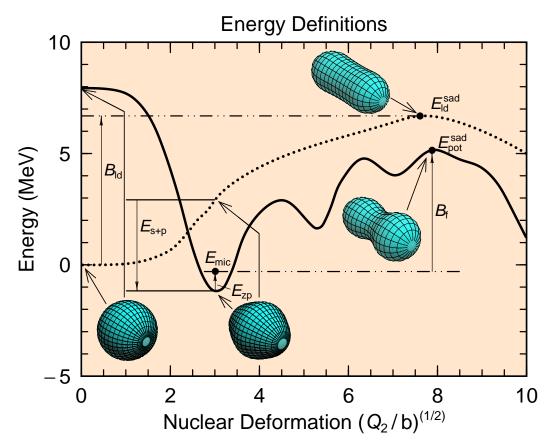


Fig. 2: Various energy concepts used in macroscopic-microscopic potential-energy calculations. The dotted line is the macroscopic "liquid-drop" (FRLDM) energy along a specified path; the solid line is the total macroscopic-microscopic energy along a partially different shape sequence. So that the various energy concepts can be illustrated, the shapes for which the energies have been calculated are: At $Q_2 = 0$ the energies are calculated for a spherical shape. For the shapes from the sphere to the ground-state shape, the shapes are the same for both curves and chosen so that they evolve continuously from the sphere to the calculated macroscopic-microscopic ground-state shape. From the ground state towards larger deformations, the total-energy curve is along the optimal fission path that includes all minima and saddle points identified along this path in the five-dimensional deformation space; the liquid-drop-energy curve joins smoothly the macroscopic energy for the shape at the macroscopic-microscopic ground-state (which is not the lowest macroscopic energy at this value of Q_2) to the FRLDM saddle point. The energies are calculated for 232 Th. B_f is the fission-barrier height, B_{Id} is the calculated macroscopic barrier height, E_{mic} is defined in eq. 2, E_{s+p} is the shell-plus-pairing correction, and E_{zp} is the zero-point energy discussed in Sect. 2.11.

account for to the diffuseness of the nuclear surface. Thus, the Yukawa-plus-exponential model for the surface tension was incorporated into the droplet model. During this work it also became apparent that the description of nuclear compressibility in the original droplet model was unsatisfactory, since the squeezing of the central density of light nuclei was overpredicted. The deficiency was serious because it starts to become important by about A = 120 and becomes even more pronounced for lighter nuclei. To account for compressibility effects for light nuclei and for other higher-order effects an empirical exponential term was added. The final modifications leading to the FRDM was the addition of a charge-asymmetry term and a constant [5, 4]. The charge-asymmetry term and the constant were originally proposed and included in the 1981 mass model [1].

The additions of these effects and terms to the droplet model [5] resulted in dramatic improvements in its predictive properties, as summarized in the discussion of Table A in Ref. [4]. Mass calculations based on both the FRLDM [3] and the FRDM [4] were presented in the 1988 review of mass models in ATOMIC DATA AND NUCLEAR DATA TABLES. These calculations also used an improved pairing model relative to that used in the 1981 work. In the 1988 results the error in the FRDM was 8% lower than that in the FRLDM.

However, there were two major unresolved issues in the 1988 calculations. First, there existed some deficiencies in the pairing model and the values of the constants that were used. Second, ε_3 and ε_6 shape degrees of freedom were still not included, so deviations between calculated and measured masses due to the omission of these shape degrees of freedom were still present. Extensive investigations of pairing models and their constants have now been completed and resulted in an improved formulation of the pairing model [16]. In the FRDM(1992) we also minimized the potential energy with respect to ε_3 and ε_6 shape degrees of freedom in an approximate fashion. In the FRDM(2012) calculation we have improved the determination of ground-state shapes very significantly and also made other improvements which will be discussed after the model specification.

Although the FRDM is now our preferred model of ground-state masses, we also present results for the FRLDM

because we are now aware that the FRDM cannot be applied to the very deformed shapes occurring in fission. The FRLDM can also be used in studies that assume constant nuclear density. We therefore specify below both models. Because several of the model constants are determined by minimization of the model error, we start by defining a proper way to determine model error, which unlike a root-mean-square "rms" definition, does not contain contributions from the experimental statistical uncertainties.

2.1. Model error and adjustment procedure

In many studies the model error has been defined as simply the rms deviation, which as usual is given by

rms =
$$\left[\frac{1}{n}\sum_{i=1}^{n}(M_{\exp}^{i}-M_{\text{th}}^{i})^{2}\right]^{\frac{1}{2}}$$
 (4)

Here $M_{\rm th}^i$ is the calculated mass for a particular value of the proton number Z and neutron number N, and $M_{\rm exp}^i$ is the corresponding measured quantity. There are n such measurements for different N and Z. The choice (4) is a reasonable definition when all the errors $\sigma_{\rm exp}^i$ associated with the measurements are small compared to the model error. However, for large $\sigma_{\rm exp}^i$ the above definition is unsatisfactory, since both the theoretical and experimental errors contribute to the rms deviation. The definition (4) will therefore always overestimate the intrinsic model error.

When the experimental errors are large, it is necessary to use an approach that "decouples" the theoretical and experimental errors from one another. This can be accomplished by observing that the calculated masses are distributed around the *true* masses with a standard deviation σ_{th} . There exist powerful statistical methods for determining the intrinsic model error σ_{th} . The model error obtained in this way contains no contributions from the experimental uncertainties σ_{exp}^i . To introduce such an error concept, a new set of equations for determining model parameters and error was derived [3] by use of statistical arguments and the maximum-likelihood (ML) method. Here we generalize from the original assumption [3] $e_{th}^i \in N(0,\sigma_{th})$ that the theoretical error term e_{th}^i is normally distributed with zero mean deviation from the true mass to $e_{th}^i \in N(\mu_{th}, \sigma_{th})$ to allow for an error with a mean μ_{th} that is different from zero and a standard deviation σ_{th} around this mean [34]. Normally, if the model is adjusted only to a specific type of data, such as masses, the mean is very close to zero for the data to which the model constants were adjusted but may be significantly different for new masses that were not included when the model constants were determined [9, 24]. We are led to the generalized equations

$$\sum_{i=1}^{n} \frac{[M_{\exp}^{i} - (M_{\text{th}}^{i} + \mu_{\text{th}}^{*})]}{\sigma_{\exp}^{i}^{2} + \sigma_{\text{th}}^{2*}} \frac{\partial M_{\text{th}}^{i}}{\partial p_{\nu}} = 0, \quad \nu = 1, 2, \dots, m$$
 (5)

$$\sum_{i=1}^{n} \frac{\left[M_{\text{exp}}^{i} - (M_{\text{th}}^{i} + \mu_{\text{th}}^{*})\right]^{2} - (\sigma_{\text{exp}}^{i}^{2} + \sigma_{\text{th}}^{2^{*}})}{(\sigma_{\text{exp}}^{i}^{2} + \sigma_{\text{th}}^{2^{*}})^{2}} = 0$$
 (6)

$$\sum_{i=1}^{n} \frac{[M_{\text{exp}}^{i} - (M_{\text{th}}^{i} + \mu_{\text{th}}^{*})]}{(\sigma_{\text{exp}}^{i} + \sigma_{\text{th}}^{2}^{*})} = 0$$
 (7)

where p_V are the unknown parameters of the model. The notation σ_{th}^{2*} means that by solving Eqs. (6) and (7) we obtain the estimate σ_{th}^{2*} of the true σ_{th}^{2} . Equation (5) is equivalent to minimizing S with respect to p_V , where

$$S = \sum_{i=1}^{n} \frac{\left[M_{\text{exp}}^{i} - (M_{\text{th}}^{i} + \mu_{\text{th}}^{*})\right]^{2}}{\sigma_{\text{exp}}^{i}^{2} + \sigma_{\text{th}}^{2}^{*}}$$
(8)

Thus, we are led to two additional equations relative to the usual least-squares equations that arise when model parameters are estimated by adjustments to experimental data under the assumption of a perfect theory with $\sigma_{th}=0$ and $\mu_{th}=0$. For the FRLDM the least-squares equations (5) are linear, whereas for the FRDM they are non-linear.

When the model contains a term a_0A^0 that is strictly constant, Eq. (7) is identical to the member in Eq. (5) that corresponds to the derivative with respect to this constant. Thus, one should in this case put $\mu_{th}^* = 0$ and solve only the remaining m+1 equations. One may therefore in this case characterize the error of the model in the region where the parameters were adjusted solely by the quantity σ_{th} . In other cases one should solve the full set of equations. If μ_{th}^* is significantly different from zero the theory needs modification. Even if $\mu_{th} = 0$ in the original data region, it is entirely possible (although undesirable) that one obtains a mean error μ_{th}^* that is substantially different from zero when one analyzes model results for new data points to which the parameters were not adjusted. In this case the most complete characterization of the theoretical error requires both its mean μ_{th} and its standard deviation σ_{th} around this mean.

To allow for a single error measure that is similar to an rms deviation between the data and model we later also calculate the square root of the second central moment of the error term, $\sigma_{th;\mu=0}$, in our studies of model behavior in new regions of nuclei. This quantity is obtained by setting $\mu_{th}^* = 0$ when solving Eq. (6). In contrast to the rms measure, it has the advantage that it has no contributions from the experimental errors.

Equations (5)–(7) constitute a system of m+2 equations that are to be solved together. It is instructive to rewrite Eqs. (6) and (7) as

$$\sigma_{\text{th}}^{2^*} = \frac{1}{\sum_{i=1}^n w_i^{k_\sigma}} \sum_{i=1}^n w_i^{k_\sigma} \left[(M_{\text{exp}}^i - M_{\text{th}}^i - \mu_{\text{th}}^*)^2 - \sigma_{\text{exp}}^{i^2} \right]$$
(9)

$$\mu_{\text{th}}^* = \frac{1}{\sum_{i=1}^n w_i^{k_{\mu}}} \sum_{i=1}^n w_i^{k_{\mu}} \left[(M_{\text{exp}}^i - M_{\text{th}}^i) \right]$$
 (10)

where

$$w_i^{\ k} = \frac{1}{(\sigma_{\rm exp}^{i}^2 + \sigma_{\rm th}^{2*})^k} \tag{11}$$

$$k_{\sigma} = 2 \tag{12}$$

$$k_{\mu} = 1 \tag{13}$$

The unknowns μ_{th}^* and σ_{th}^{2*} can easily be determined from Eqs. (9) and (10) by an iterative procedure whose convergence is extremely rapid, requiring only about four iterations. An *interpretation*, not a proof, of Eq. (9) is that the experimental error is "subtracted out" from the difference between the experimental and calculated masses.

A common misconception is that one has to "throw away" data points that have errors that are equal to or larger than the error of the model whose parameters are determined. When a proper statistical approach, such as the one above, is used, this is no longer necessary, as is further illustrated by simulations in Ref. [3].

We will see below that the discrepancy between our mass calculations and measured masses systematically increases as the size of the nuclear system decreases. It is therefore of interest to consider that the mass-model error is a function of mass number A. A simple function to investigate is

$$\sigma_{\rm th} = \frac{c}{A^{\alpha}} \tag{14}$$

where c and α are two parameters to be determined. Whereas under the assumption of a constant model error one determines this single error constant from Eq. (9), we find that the ML method for the error assumption in Eq. (14), with two unknowns, and assuming $\mu_{th} = 0$, yields the equations

$$\sum_{i=1}^{n} \frac{(M_{\text{exp}}^{i} - M_{\text{th}}^{i})^{2} - \left[\sigma_{\text{exp}}^{i}^{2} + \left(\frac{c^{*}}{A_{i}^{\alpha^{*}}}\right)^{2}\right]}{\left[\sigma_{\text{exp}}^{i}^{2} + \left(\frac{c^{*}}{A_{i}^{\alpha^{*}}}\right)^{2}\right]^{2} A_{i}^{\alpha^{*}}} = 0$$
(15)

$$\sum_{i=1}^{n} \frac{(M_{\exp}^{i} - M_{\text{th}}^{i})^{2} - \left[\sigma_{\exp}^{i}^{2} + \left(\frac{c^{*}}{A_{i}^{\alpha^{*}}}\right)^{2}\right]}{\left[\sigma_{\exp}^{i}^{2} + \left(\frac{c^{*}}{A_{i}^{\alpha^{*}}}\right)^{2}\right]^{2} A_{i}^{\alpha^{*}+1}} = 0$$
(16)

These equations are considerably more complicated to solve than Eq. (9). Solutions were obtained for the FRDM(1992) in Ref. [9]. We have also studied the error versus A in the FRDM(2012), see Sect. 5.3.2.

2.2. Shape parameterizations

The original parameterization of the folded-Yukawa single-particle model was the three-quadratic-surface parameterization [35, 10]. It was designed to allow great flexibility in describing shapes late in the fission process. However, it is less suitable for describing ground-state shapes.

To allow a better description of ground-state shapes and to allow close comparison with results of Nilsson modified-oscillator calculations, we incorporated the Nilsson perturbed-spheroid parameterization, or ε parameterization, into the folded-Yukawa single-particle computer code in 1973 [36, 32, 37].

In our work we use the ε parameterization for all calculations related to ground-state properties. In our adjustment of macroscopic constants of the FRLDM we also include 31 outer saddle-point heights of fission barriers. The shapes of these saddle points were obtained in a modern barrier calculation based on several million different shapes in the three-quadratic-surface parameterization [38, 39].

2.2.1. Perturbed-spheroid parameterization

The ε parameterization was originally used by Nilsson [40] in the modified-oscillator single-particle potential. It was introduced to limit the dimensions of the matrices from which the single-particle energies and wave functions are obtained by diagonalization. This requirement leads to somewhat complex expressions for the nuclear shape. Here we employ its extension to higher-multipole distortions. In contrast to the FRDM(1992) mass table we now also consider axially asymmetric shapes [41, 42, 43]. Note that a factor $\frac{1}{2}\sqrt{\frac{4\pi}{9}}$ is missing in front of the $V_4(\gamma)$ function in Eq. (3) of Ref. [43]. Some misprints in the equations presented in Ref. [9] are corrected below. Some studies of the effect of axial asymmetry and octupole degrees of freedom on nuclear masses were presented in Refs. [44, 45]. Consideration of axial asymmetry is needed to study shape coexistence. We presented earlier studies of shape coexistence throughout the nuclear chart in Refs. [25, 46].

As the first step in defining the ε parameterization a "stretched" representation is introduced. The stretched coordinates ξ , η , and ζ are defined by

$$\xi = \left\{ \frac{m\omega_0}{\hbar} \left[1 - \frac{2}{3} \varepsilon_2 \cos \left(\gamma + \frac{2}{3} \pi \right) \right] \right\}^{1/2} x$$

$$\eta = \left\{ \frac{m\omega_0}{\hbar} \left[1 - \frac{2}{3} \varepsilon_2 \cos \left(\gamma - \frac{2}{3} \pi \right) \right] \right\}^{1/2} y$$

$$\zeta = \left\{ \frac{m\omega_0}{\hbar} \left[1 - \frac{2}{3} \varepsilon_2 \cos \gamma \right] \right\}^{1/2} z$$
(17)

where $\hbar\omega_0$ is the oscillator energy, ε_2 the ellipsoidal deformation parameter, and γ the non-axiality angle. It is then convenient to define a "stretched" radius vector ρ_t by

$$\rho_{\rm t} = (\xi^2 + \eta^2 + \zeta^2)^{1/2} \tag{18}$$

a stretched polar angle θ_t by

$$u = \cos \theta_{t} = \frac{\zeta}{\rho_{t}} = \left[\frac{1 - \frac{2}{3}\varepsilon_{2}\cos\gamma}{1 - \frac{1}{3}\varepsilon_{2}\cos\gamma(3\cos^{2}\theta - 1) + \left(\frac{1}{3}\right)^{1/2}\varepsilon_{2}\sin\gamma\sin^{2}\theta\cos2\phi} \right]^{1/2} \cos\theta$$
 (19)

and a stretched azimuthal angle ϕ_t by

$$v = \cos 2\phi_{t} = \frac{\xi^{2} - \eta^{2}}{\xi^{2} + \eta^{2}} = \frac{\left[1 + \frac{1}{3}\varepsilon_{2}\cos\gamma\right]\cos 2\phi + \left(\frac{1}{3}\right)^{1/2}\varepsilon_{2}\sin\gamma}{1 + \frac{1}{3}\varepsilon_{2}\cos\gamma + \left(\frac{1}{3}\right)^{1/2}\varepsilon_{2}\sin\gamma\cos 2\phi}$$
(20)

In the folded-Yukawa model the single-particle potential is very different from that in the Nilsson modified-oscillator model. However, the definition of the ε parameterization will be most clear if we follow the steps in the Nilsson model. The implementation in the folded-Yukawa model will then be simple. The Nilsson modified-oscillator potential is defined by

$$V = \frac{1}{2}\hbar\omega_{0}\rho_{t}^{2} \left\{ 1 + 2\varepsilon_{1}P_{1}(\cos\theta_{t}) - \frac{2}{3}\varepsilon_{2}\cos\gamma P_{2}(\cos\theta_{t}) + \frac{1}{3}\varepsilon_{2}\sin\gamma \left(\frac{8}{5}\pi\right)^{1/2} \left[Y_{2}^{2}(\theta_{t},\phi_{t}) + Y_{2}^{-2}(\theta_{t},\phi_{t})\right] + 2\varepsilon_{3}P_{3}(\cos\theta_{t}) + 2\varepsilon_{4}V_{4}(\cos\theta_{t},\cos2\phi_{t}) + 2\varepsilon_{5}P_{5}(\cos\theta_{t}) + 2\varepsilon_{6}P_{6}(\cos\theta_{t})\right\} - \kappa\hbar \mathring{\omega}_{0} \left[2\vec{l}_{t}\cdot\vec{s} + \mu(\vec{l}_{t}^{2} - \langle\vec{l}_{t}^{2}\rangle)\right]$$

$$(21)$$

where \vec{l}_t is the angular-momentum operator in the stretched coordinate system, \vec{s} is the spin operator [40], and

$$V_4(u,v) = a_{40}P_4 + \sqrt{\frac{4\pi}{9}} \left[a_{42}(Y_4^2 + Y_4^{-2}) + a_{44}(Y_4^4 + Y_4^{-4}) \right]$$
 (22)

Here the hexadecapole potential $V_4(u, v)$ is made dependent on γ in such a way that axial symmetry is maintained when $\gamma = 0$, 60° , -120° , and -60° , for mass-symmetric shapes and for $\varepsilon_6 = 0$. This is accomplished by choosing

the coefficients a_{4i} so that they have the transformation properties of a hexadecapole tensor. However, this is achieved only for mass-symmetric shapes and for $\varepsilon_6 = 0$. The ε parameterization has not been generalized to a more general case. Thus [43]

$$a_{40} = \frac{1}{6} (5\cos^2 \gamma + 1)$$

$$a_{42} = -\frac{1}{12} \sqrt{30} \sin 2\gamma$$

$$a_{44} = \frac{1}{12} \sqrt{70} \sin^2 \gamma$$
(23)

It is customary to now assume that the shape of the nuclear surface is equal to the shape of an equipotential surface given by Eq. (21). By neglecting the $\vec{l}_t \cdot \vec{s}$ and \vec{l}_t^2 terms and solving for ρ_t and then using Eqs. (17)–(20) to derive an expression for r in the non-stretched laboratory system we obtain

$$r(\theta,\phi) = \frac{R_0}{\omega_0/\overset{\circ}{\omega}_0} \left\{ \left[1 - \frac{2}{3}\varepsilon_2 \cos\left(\gamma + \frac{2}{3}\pi\right) \right] \left[1 - \frac{2}{3}\varepsilon_2 \cos\left(\gamma - \frac{2}{3}\pi\right) \right] \left[1 - \frac{2}{3}\varepsilon_2 \cos\gamma \right] \right\}^{-1/2}$$

$$\times \left[1 - \frac{1}{3}\varepsilon_2 \cos\gamma - \frac{2}{9}\varepsilon_2^2 \cos^2\gamma + \varepsilon_2 \left(\cos\gamma + \frac{1}{3}\varepsilon_2 \cos2\gamma \right) u^2 - \left(\frac{1}{3} \right)^{1/2} \varepsilon_2 \sin\gamma \left(1 - \frac{2}{3}\varepsilon_2 \cos\gamma \right) (1 - u^2) v \right]^{1/2}$$

$$\times \left[1 - \frac{2}{3}\varepsilon_2 \cos\gamma \frac{1}{2} (3u^2 - 1) + \left(\frac{1}{3} \right)^{1/2} \varepsilon_2 \sin\gamma (1 - u^2) v \right]$$

$$+ 2\varepsilon_1 P_1(u) + 2\varepsilon_3 P_3(u) + 2\varepsilon_4 V_4(u, v) + 2\varepsilon_5 P_5(u) + 2\varepsilon_6 P_6(u) \right]^{-1/2}$$

$$(24)$$

In the Nilsson model the starting point is to define the potential. After the potential has been generated the shape of the nuclear surface is deduced by the above argument. In the folded-Yukawa model the starting point is different. There, the equation for the nuclear surface, given by Eq. (24) in the case of the ε parameterization, is specified in the initial step. Once the shape of the surface is known, the single-particle potential may be generated as described in later sections.

The quantity $\omega_0/\mathring{\omega}_0$ is determined by requiring that the volume remain constant with deformation, which gives

$$\left(\frac{\omega_{0}}{\mathring{\omega}_{0}}\right)^{3} = \frac{1}{4\pi} \left\{ \left[1 - \frac{2}{3}\varepsilon_{2}\cos\left(\gamma + \frac{2}{3}\pi\right) \right] \left[1 - \frac{2}{3}\varepsilon_{2}\cos\left(\gamma - \frac{2}{3}\pi\right) \right] \left[1 - \frac{2}{3}\varepsilon_{2}\cos\gamma \right] \right\}^{-1/2} \times \int_{0}^{\pi} d\theta_{t} \int_{0}^{2\pi} d\phi_{t} \sin\theta_{t} \left[1 - \frac{2}{3}\varepsilon_{2}\cos\gamma P_{2}(u) + \varepsilon_{2}\sin\gamma \left(\frac{8\pi}{45}\right)^{1/2} (Y_{2}^{2} + Y_{2}^{-2}) + 2\varepsilon_{1}P_{1}(u) + 2\varepsilon_{3}P_{3}(u) + 2\varepsilon_{4}V_{4}(u,v) + 2\varepsilon_{5}P_{5}(u) + 2\varepsilon_{6}P_{6}(u) \right]^{-3/2}$$
(25)

The above equation is derived by determining the volume inside the nuclear surface given by Eq. (24), with the integral $\int d^3r$ inside the surface evaluated in terms of the "non-stretched" coordinates θ and ϕ . After a variable substitution one arrives at the expression in Eq. (25).

The Legendre polynomials P_l occurring in the definitions of the ε parameterization are defined by

$$P_l(u) = \frac{1}{2^l l!} \frac{d^l}{du^l} (u^2 - 1)^l , \quad l = 0, 1, 2, \dots, \infty$$
 (26)

The first six Legendre polynomials are

$$P_{0}(u) = 1$$

$$P_{1}(u) = u$$

$$P_{2}(u) = \frac{1}{2}(3u^{2} - 1)$$

$$P_{3}(u) = \frac{1}{2}(5u^{3} - 3u)$$

$$P_{4}(u) = \frac{1}{8}(35u^{4} - 30u^{2} + 3)$$

$$P_{5}(u) = \frac{1}{8}(63u^{5} - 70u^{3} + 15u)$$

$$P_{6}(u) = \frac{1}{16}(231u^{6} - 315u^{4} + 105u^{2} - 5)$$
(27)

The associated Legendre functions P_1^m are defined by

$$P_l^m(u) = \frac{(1 - u^2)^{m/2}}{2^l l!} \frac{d^{l+m}}{du^{l+m}} (u^2 - 1)^l , \quad l = 0, 1, 2, \dots, \infty; \quad m = 0, 1, 2, \dots, l$$
 (28)

The spherical harmonics are then determined from the relations

$$Y_l^m(\theta,\phi) = (-)^m \left[\frac{(2l+1)}{4\pi} \frac{(l-m)!}{(l+m)!} \right]^{1/2} P_l^m(\cos\theta) e^{im\phi} , \quad m \ge 0$$
 (29)

$$Y_{l}^{m*}(\theta,\phi) = (-)^{m}Y_{l}^{-m}(\theta,\phi)$$
(30)

which yield for the functions used here

$$Y_{2}^{2}(\theta,\phi) = \sqrt{\frac{15}{32\pi}} \sin^{2}\theta e^{2i\phi}$$

$$Y_{2}^{-2}(\theta,\phi) = \sqrt{\frac{15}{32\pi}} \sin^{2}\theta e^{-2i\phi}$$

$$Y_{4}^{4}(\theta,\phi) = \sqrt{\frac{315}{512\pi}} \sin^{4}\theta e^{4i\phi}$$

$$Y_{4}^{-4}(\theta,\phi) = \sqrt{\frac{315}{512\pi}} \sin^{4}\theta e^{-4i\phi}$$

$$Y_{4}^{2}(\theta,\phi) = \sqrt{\frac{45}{128\pi}} \sin^{2}\theta (7\cos^{2}\theta - 1)e^{2i\phi}$$

$$Y_{4}^{-2}(\theta,\phi) = \sqrt{\frac{45}{128\pi}} \sin^{2}\theta (7\cos^{2}\theta - 1)e^{-2i\phi}$$
(31)

The sums

$$SY_{22} = Y_2^2(\theta, \phi) + Y_2^{-2}(\theta, \phi)$$

$$SY_{44} = Y_4^4(\theta, \phi) + Y_4^{-4}(\theta, \phi)$$

$$SY_{42} = Y_4^2(\theta, \phi) + Y_4^{-2}(\theta, \phi)$$
(32)

are required in the expression for the single-particle potential and in the corresponding equation for the nuclear surface. When the arguments of the spherical harmonics are the stretched angles θ_t and ϕ_t we obtain

$$SY_{22} = \sqrt{\frac{15}{8\pi}} \sin^2 \theta_t \cos 2\phi_t = \sqrt{\frac{15}{8\pi}} (1 - u^2) v$$

$$SY_{44} = \sqrt{\frac{315}{128\pi}} \sin^4 \theta \cos 4\phi = \sqrt{\frac{315}{128\pi}} (1 - u^2)^2 (2v^2 - 1)$$

$$SY_{42} = \sqrt{\frac{45}{32\pi}} \sin^2 \theta_t (7\cos^2 \theta_t - 1)\cos 2\phi_t = \sqrt{\frac{45}{32\pi}} (1 - u^2)(7u^2 - 1) v$$
(33)

2.2.2. Three-quadratic-surface parameterization

In the three-quadratic-surface parameterization the shape of the nuclear surface is defined in terms of three smoothly joined portions of quadratic surfaces of revolution. They are completely specified by [35, 36, 32],

$$\rho^{2} = \begin{cases} a_{1}^{2} - \frac{a_{1}^{2}}{c_{1}^{2}} (z - l_{1})^{2} , & l_{1} - c_{1} \leq z \leq z_{1} \\ a_{2}^{2} - \frac{a_{2}^{2}}{c_{2}^{2}} (z - l_{2})^{2} , & z_{2} \leq z \leq l_{2} + c_{2} \\ a_{3}^{2} - \frac{a_{3}^{2}}{c_{3}^{2}} (z - l_{3})^{2} , & z_{1} \leq z \leq z_{2} \end{cases}$$

$$(34)$$

The left-hand surface is denoted by the subscript 1, the right-hand one by 2, and the middle one by 3. Each surface is specified by the position l_i of its center, its transverse semiaxis a_i , and its semi-symmetry axis c_i . At the left and right intersections of the middle surface with the end surfaces the value of z is z_1 and z_2 , respectively.

There are nine numbers required to specify the expressions in Eq. (34) but three numbers are eliminated by the conditions of constancy of the volume and continuous first derivatives at z_1 and z_2 . The introduction of an auxiliary unit of distance u through

$$u = \left[\frac{1}{2}\left(a_1^2 + a_2^2\right)\right]^{\frac{1}{2}} \tag{35}$$

permits the definition of three mass-symmetric coordinates σ_i and three mass-asymmetric coordinates α_i by

$$\sigma_{1} = \frac{(l_{2} - l_{1})}{u}$$

$$\sigma_{2} = \frac{a_{3}^{2}}{c_{3}^{2}}$$

$$\sigma_{3} = \frac{1}{2} \left(\frac{a_{1}^{2}}{c_{1}^{2}} + \frac{a_{2}^{2}}{c_{2}^{2}} \right)$$

$$\alpha_{1} = \frac{1}{2} \frac{(l_{1} + l_{2})}{u}$$

$$\alpha_{2} = \frac{(a_{1}^{2} - a_{2}^{2})}{u^{2}}$$

$$\alpha_{3} = \frac{a_{1}^{2}}{c_{1}^{2}} - \frac{a_{2}^{2}}{c_{2}^{2}}$$
(36)

The coordinate α_1 is not varied freely but is instead determined by the requirement that the center of mass be at the origin. These shape coordinates were historically used for about 30 years [35, 10, 47, 48, 49, 50, 1, 2, 51, 52]. However when we started to explore the full five-dimensional shape space we realized that an intuitive interpretation of calculations based on these coordinates is difficult and have introduced instead five alternative shape coordinates:(1) elongation, expressed in terms of the charge quadrupole moment Q_2 , (2) neck diameter d, (3) left nascent-fragment deformation ε_{f1} , (4) right nascent-fragment deformation ε_{f2} , and (5) mass asymmetry α_g . The transformations from these coordinates to the precise shape given by Eq. (34) are lengthy and as regards the neck diameter highly nonlinear so we refer to Ref. [39] for details. These deformation variables have been used exclusively in our fission studies since 1999, the more important ones being [53, 54, 55, 38, 56, 57, 58, 39, 59, 60, 61]. However, the actual shapes generated by the expressions in Eq. (34) are the same, regardless of what primary "deformation" coordinates we use, it is just the interpretation of the calculated fission potential-energy surfaces that is facilitated by our more recent choices. One should also note that in our recent studies where we calculate potential-energy surfaces for more than 5 million shapes, we actually study (on a discrete, densely spaced grid) *all* shapes accessible to the parameterization, which would have been an impossible task some decades ago.

2.2.3. Conversions to β parameters

A common parameterization, which we do *not* use here, is the β parameterization. However, since we want to present some of our results in terms of β shape parameters, we introduce the parameterization and a scheme to express shapes generated in other parameterizations in terms of β deformation parameters. In the β parameterization the radius vector r is defined by

$$r(\theta, \phi) = R_0 (1 + \sum_{l=1}^{\infty} \sum_{m=-l}^{l} \beta_{lm} Y_l^m)$$
(37)

where R_0 is deformation dependent so as to conserve the volume inside the nuclear surface. When only axially symmetric shapes are considered the notation β_l is normally used for β_{l0} . Since the spherical harmonics Y_l^m are orthogonal, one may determine the β parameters corresponding to a specific shape in the ε parameterization by use of

$$\beta_{lm} = \sqrt{4\pi} \frac{\int r(\theta, \phi) Y_l^m(\theta, \phi) d\Omega}{\int r(\theta, \phi) Y_0^0(\theta, \phi) d\Omega}$$
(38)

where r is now the radius vector in the ε parameterization, given by Eq. (24). This conversion equation is in fact valid for a radius vector $r(\theta, \phi)$ defined by any parameterization.

When the β parameters corresponding to a specific shape in the ε parameterization are determined, one should observe that higher-order β parameters may be non-zero even if higher-order ε parameters are identically zero. For this reason, the nuclear ground-state shape is not completely specified by the β parameters in the Table, whereas the shape is completely defined by the ε parameters.

2.3. Finite-range droplet model

The *finite-range droplet model*, developed in 1984 [5], combines the finite-range effects of the FRLDM [62, 63, 33] with the higher-order terms in the droplet model. In addition, the finite-range droplet model contains an exponential term

$$-CAe^{-\gamma A^{1/3}}\overline{\varepsilon} \tag{39}$$

where C and γ specify the strength and range, respectively, of this contribution to the energy and the quantity $\overline{\epsilon}$ is a dilatation variable given by Eq. (49). The exponential term leads to an improved description of compressibility effects. As in the original mass model [1] we have also added a constant A^0 term (whose coefficient accidentally came out to be zero in the FRDM(1992) mass table) and a charge asymmetry term, see Eqs. (40,62). All these terms turn out to be crucial to the substantially improved results obtained in the finite-range droplet model relative to the original droplet model. These empirical terms will be further discussed below.

Most of our results are based on the finite-range droplet model for the macroscopic term. Relative to the formulation given in Ref. [5], which unfortunately has numerous misprints, we use a new model for the average neutron and proton pairing gaps. The complete expression for the contribution to the atomic mass excess from the FRDM macroscopic energy is obtained after minimization with respect to variations in $\bar{\epsilon}$ and $\bar{\delta}$, where $\bar{\delta}$ is the average bulk

 $E_{\rm mac}(Z, N, {\rm shape}) =$

(40)

relative neutron excess given by Eq. (47). One then obtains

$$M_{\rm H}Z + M_{\rm n}N$$
 mass excesses of Z hydrogen atoms and N neutrons

$$+ \left(-a_1 + J\overline{\delta}^2 - \frac{1}{2}K\overline{\varepsilon}^2\right)A$$
 volume energy

+
$$\left(a_2B_1 + \frac{9}{4}\frac{J^2}{Q}\overline{\delta}^2\frac{B_s^2}{B_1}\right)A^{2/3}$$
 surface energy

$$+ a_3 A^{1/3} B_k$$
 curvature energy

$$+ a_0 A^0$$
 A energy

$$+ c_1 \frac{Z^2}{A^{1/3}} B_3$$
 Coulomb energy

$$-c_2Z^2A^{1/3}B_r$$
 volume redistribution energy

$$-c_4 \frac{Z^{4/3}}{A^{1/3}}$$
 Coulomb exchange correction

$$-c_5 Z^2 \frac{B_{\rm w} B_{\rm s}}{B_1}$$
 surface redistribution energy

$$+ f_0 \frac{Z^2}{A}$$
 proton form-factor correction to the Coulomb energy

$$-c_{\rm a}(N-Z)$$
 charge-asymmetry energy

$$+$$
 $W\left(|I| + \begin{cases} 1/A , Z \text{ and } N \text{ odd and equal} \\ 0 , \text{ otherwise} \end{cases}\right)$ Wigner energy

$$+ \begin{array}{l} \left\{ \begin{array}{l} +\overline{\Delta}_{p} + \overline{\Delta}_{n} - \delta_{np} \;\; , \quad Z \; \text{and} \; N \; \text{odd} \\ \\ +\overline{\Delta}_{p} \;\; , \qquad \qquad Z \; \text{odd} \; \text{and} \; N \; \text{even} \\ \\ +\overline{\Delta}_{n} \;\; , \qquad \qquad Z \; \text{even} \; \text{and} \; N \; \text{odd} \\ \\ +0 \;\; , \qquad \qquad Z \; \text{and} \; N \; \text{even} \end{array} \right. \quad \text{average pairing energy}$$

$$-a_{\rm el}Z^{2.39}$$
 energy of bound electrons

where A=Z+N is the mass number and I=(N-Z)/A is the relative neutron excess. This expression differs from the corresponding one used in our earlier calculations [5] only in the form of the average pairing energy appearing in the next-to-last term. One should note that after minimization the exponential term [Eq. (39)] is present only implicitly in Eq. (40) through its presence in Eq. (49). For the average neutron pairing gap $\overline{\Delta}_n$, average proton pairing gap $\overline{\Delta}_p$, and average neutron-proton interaction energy δ_{np} we now use [16, 64, 65]

$$\overline{\Delta}_{\rm n} = \frac{r_{\rm mac}B_{\rm s}}{N^{1/3}} \tag{41}$$

$$\overline{\Delta}_{p} = \frac{r_{\text{mac}}B_{s}}{Z^{1/3}} \tag{42}$$

$$\delta_{\rm np} = \frac{h}{B_{\rm s}A^{2/3}} \tag{43}$$

These expressions contain only two adjustable constants r_{mac} and h, which are further discussed in Sect. 2.4. The zero reference point for the pairing energy now corresponds to even-even nuclei rather than to halfway between even-even and odd-odd nuclei as was sometimes done earlier [1, 2].

The quantities c_1 , c_2 , c_4 , and c_5 are defined by

$$c_{1} = \frac{3}{5} \frac{e^{2}}{r_{0}}$$

$$c_{2} = \frac{1}{336} \left(\frac{1}{J} + \frac{18}{K}\right) c_{1}^{2}$$

$$c_{4} = \frac{5}{4} \left(\frac{3}{2\pi}\right)^{2/3} c_{1}$$

$$c_{5} = \frac{1}{64Q} c_{1}^{2}$$
(44)

In Eq. (40) we have kept only the first term in the expression for the proton form-factor correction to the Coulomb energy, so that f_0 is given by

$$f_0 = -\frac{1}{8} \left(\frac{145}{48} \right) \frac{r_p^2 e^2}{r_0^3} \tag{45}$$

The bulk nuclear asymmetry δ is defined in terms of the neutron density ρ_n and proton density ρ_p by

$$\delta = \frac{\rho_{\rm n} - \rho_{\rm p}}{\rho_{\rm bulk}} \tag{46}$$

and the average bulk nuclear asymmetry is given by

$$\overline{\delta} = \left(I + \frac{3}{16} \frac{c_1}{Q} \frac{Z}{A^{2/3}} \frac{B_{\text{v}} B_{\text{s}}}{B_1}\right) / \left(1 + \frac{9}{4} \frac{J}{Q} \frac{1}{A^{1/3}} \frac{B_{\text{s}}^2}{B_1}\right)$$
(47)

The relative deviation in the bulk of the density ρ from its nuclear matter value ρ_0 is defined by

$$\varepsilon = -\frac{1}{3} \frac{\rho - \rho_0}{\rho_0} \tag{48}$$

and the average relative deviation in the bulk of the density is given by

$$\overline{\varepsilon} = \left(Ce^{-\gamma A^{1/3}} - 2a_2 \frac{B_2}{A^{1/3}} + L\overline{\delta}^2 + c_1 \frac{Z^2}{A^{4/3}} B_4 \right) / K \tag{49}$$

The quantity B_1 is the relative generalized surface or nuclear energy in a model that accounts for the effect of the finite range of the nuclear force. It is given by

$$B_{1} = \frac{A^{-2/3}}{8\pi^{2}r_{0}^{2}a^{4}} \iint_{V} \left(2 - \frac{|\mathbf{r} - \mathbf{r}'|}{a}\right) \frac{e^{-|\mathbf{r} - \mathbf{r}'|/a}}{|\mathbf{r} - \mathbf{r}'|/a} d^{3}r d^{3}r'$$
(50)

where the integration is over the specified sharp-surface deformed *generating* shape of volume V. Since the volume of the generating shape is conserved during deformation we have

$$V = \frac{4\pi}{3}R_0^3 \tag{51}$$

where R_0 is the radius of the spherical shape. The relative Coulomb energy B_3 is given by

$$B_{3} = \frac{15}{32\pi^{2}} \frac{A^{-5/3}}{r_{0}^{5}} \iint_{V} \frac{d^{3}r d^{3}r'}{|\mathbf{r} - \mathbf{r}'|} \left[1 - \left(1 + \frac{1}{2} \frac{|\mathbf{r} - \mathbf{r}'|}{a_{\text{den}}} \right) e^{-|\mathbf{r} - \mathbf{r}'|/a_{\text{den}}} \right]$$
(52)

The quantities B_1 and B_3 are evaluated for $R_0 = r_0 A^{1/3}$. However, in the FRDM the equilibrium value R_{den} of the equivalent-sharp-surface radius corresponding to the nuclear density is given by the expression

$$R_{\rm den} = r_0 A^{1/3} (1 + \overline{\varepsilon}) \tag{53}$$

Thus, the actual value of the nuclear radius is determined by the balance between Coulomb, compressibility, and surface-tension effects as expressed by Eq. (49). To calculate this balance it is necessary to know the response of the surface-energy and Coulomb-energy terms B_1 and B_3 to size changes. To account for this response we introduce the

quantities B_2 and B_4 , which are related to the derivatives of B_1 and B_3 . These derivatives are evaluated numerically and during this evaluation the radius R of the *generating* shape is varied around the value $r_0A^{1/3}$.

The quantity B_2 , which as mentioned above is related to the derivative of the relative generalized surface energy B_1 , is defined by

$$B_2 = \frac{1}{2x_0} \left[\frac{d}{dx} \left(x^2 B_1 \right) \right]_{x = x_0} \tag{54}$$

with

$$x = \frac{R}{a}$$
 and $x_0 = \frac{r_0 A^{1/3}}{a}$ (55)

The quantity B_4 is related to the derivative of the relative Coulomb energy B_3 and is defined by

$$B_4 = -y_0^2 \left[\frac{d}{dy} \left(\frac{B_3}{y} \right) \right]_{y=y_0} \tag{56}$$

with

$$y = \frac{R}{a_{\text{den}}}$$
 and $y_0 = \frac{r_0 A^{1/3}}{a_{\text{den}}}$ (57)

For spherical shapes the quantities B_1 , B_2 , B_3 , and B_4 can be evaluated analytically. One obtains

$$B_{1}^{(0)} = 1 - \frac{3}{x_{0}^{2}} + (1 + x_{0}) \left(2 + \frac{3}{x_{0}} + \frac{3}{x_{0}^{2}} \right) e^{-2x_{0}}$$

$$B_{2}^{(0)} = 1 - \left(1 + 2x_{0} + 2x_{0}^{2} \right) e^{-2x_{0}}$$

$$B_{3}^{(0)} = 1 - \frac{5}{y_{0}^{2}} \left[1 - \frac{15}{8y_{0}} + \frac{21}{8y_{0}^{3}} - \frac{3}{4} \left(1 + \frac{9}{2y_{0}} + \frac{7}{y_{0}^{2}} + \frac{7}{2y_{0}^{3}} \right) e^{-2y_{0}} \right]$$

$$B_{4}^{(0)} = 1 + 5 \left[-\frac{3}{y_{0}^{2}} + \frac{15}{2y_{0}^{3}} - \frac{63}{4y_{0}^{5}} + \frac{3}{4} \left(\frac{2}{y_{0}} + \frac{12}{y_{0}^{2}} + \frac{32}{y_{0}^{3}} + \frac{42}{y_{0}^{4}} + \frac{21}{y_{0}^{5}} \right) e^{-2y_{0}} \right]$$
(58)

The expression B_3 for the relative Coulomb energy yields the energy for an arbitrarily shaped, homogeneously charged, diffuse-surface nucleus to all orders in the diffuseness constant a_{den} . The constants in front of the integrals for B_1 and B_3 are chosen so that B_1 and B_3 are 1 for a sphere in the limit in which the range constant a and the diffuseness constant a_{den} are zero, in analogy with the definition of the quantities B_s and B_c in the standard liquid-drop and droplet models. The quantities B_2 and B_4 , which are related to the derivatives of B_1 and B_3 , respectively, were introduced above to treat the response of the nucleus to a change in size, resulting from a finite compressibility. The shape-dependent quantities B_s , B_v , B_w , B_k , and B_r , which are defined [7] in the standard droplet model, are given by

$$B_{\rm s} = \frac{A^{-2/3}}{4\pi r_0^2} \int_S dS \qquad \text{surface energy}$$

$$B_{\rm v} = -\frac{15A^{-4/3}}{16\pi^2 r_0^4} \int_S \widetilde{W}(\mathbf{r}) dS \qquad \text{neutron skin energy}$$

$$B_{\rm w} = \frac{225A^{-2}}{64\pi^3 r_0^6} \int_S \left[\widetilde{W}(\mathbf{r})\right]^2 dS \qquad \text{surface redistribution energy}$$

$$B_{\rm k} = \frac{A^{-1/3}}{8\pi r_0} \int_S \left(\frac{1}{R_1} + \frac{1}{R_2}\right) dS \qquad \text{curvature energy}$$

$$B_{\rm r} = \frac{1575A^{-7/3}}{64\pi^3 r_0^7} \int_V \left[\widetilde{W}(\mathbf{r})\right]^2 d^3r \quad \text{volume redistribution energy}$$
(59)

where

$$W(\mathbf{r}) = \int_{V} \frac{1}{|\mathbf{r} - \mathbf{r}'|} d^{3}r'$$

$$\overline{W} = \frac{3A^{-1}}{4\pi r_{0}^{3}} \int_{V} W(\mathbf{r}) d^{3}r$$

$$\widetilde{W}(\mathbf{r}) = W(\mathbf{r}) - \overline{W}$$
(60)

and R_1 and R_2 are the principal radii of curvature.

2.4. Values of FRDM macroscopic-model constants

The constants appearing in the expression for the finite-range droplet macroscopic model fall into four categories. The first category, which represents fundamental constants, includes [1, 2]

```
M_{\rm H} = 7.289034 \text{ MeV} hydrogen-atom mass excess M_{\rm n} = 8.071431 \text{ MeV} neutron mass excess e^2 = 1.4399764 \text{ MeV fm} electronic charge squared
```

One should note that for consistency we continue to use the same values for the fundamental constants as in our 1981 mass calculation [1, 2]. Results of a more recent evaluation of the fundamental constants appear in Refs. [66].

The second category, which represents constants that have been determined from considerations other than nuclear masses, includes [1, 2, 3, 4]

a_{el}	=	$1.433 \times 10^{-5} \text{ MeV}$	electronic-binding constant
K	=	240 MeV	nuclear compressibility constant
$r_{ m p}$	=	0.80 fm	proton root-mean-square radius
r_0	=	1.16 fm	nuclear-radius constant
a	=	0.68 fm	range of Yukawa-plus-exponential potential
$a_{\rm den}$	=	0.70 fm	range of Yukawa function used to
			generate nuclear charge distribution

The third category, representing those constants whose values were obtained from consideration of odd-even mass differences [64, 65, 16] and other mass-like quantities, are

```
r_{\text{mac}} = 4.80 \text{ MeV} average pairing-gap constant

h = 6.6 \text{ MeV} neutron-proton interaction constant

W = 30 \text{ MeV} Wigner constant

a_3 = 0 \text{ MeV} curvature-energy constant
```

It should be noted that the final calculated mass excess is strictly independent of the value used for r_{mac} . This constant affects only the division of the mass excess between a macroscopic part and the remaining microscopic correction. We will therefore not include r_{mac} when we later count the number of constants in our mass model. It is the pairing constant r_{mic} which enters the microscopic model that affects the mass excess. It will be discussed below.

Since $\mu_{th} = 0$ in our case, Eqs. (9) and (11) can be solved with the experimental data set of 2149 masses with $Z \ge 8$ and $N \ge 8$ [17] to determine the remaining macroscopic constants and the error of our model. We do not adjust the FRDM to fission barrier heights, because it is only accurate for small deformations around a sphere, not for the highly deformed shapes occurring in fission. Therefore there is no need to introduce a shape dependence for the A^0 and Wigner terms, which we, as discussed below, do introduce in the FRLDM expressions. To present all the macroscopic model constants together, we list them here but discuss their adjustment later. These constants are

```
16.194882 MeV
                            volume-energy constant
        22.763235 MeV
                            surface-energy constant
a_2
              32.3 MeV
                            symmetry-energy constant
             28.72 MeV
Q
                            effective surface-stiffness constant
                            density-symmetry constant
              53.5 MeV
              -4.0 MeV
                            A^0 constant
            0.4894 MeV
                            charge-asymmetry constant
C
              205 MeV
                            pre-exponential compressibility-term constant
             0.988
                            exponential compressibility-term range constant
```

The resulting error in the FRDM(2012) is $\sigma_{th} = 0.5595$ MeV. We refer to K as compressibility constant and L as density-symmetry constant, following the designations in the original droplet model [6]. In other contexts, for example in Refs. [67, 68] K is referred to as the incompressibility constant and L as the slope of the symmetry energy at saturation density. In the droplet and finite-range droplet models finiteness is held to be of higher order and not treated, leading to a single compressibility constant.

For completeness we also specify the mass-energy conversion factor used in the interim 1989 mass evaluation. In this evaluation the relation between atomic mass units and energy is given by [18]

$$1 u = 931.5014 \text{ MeV}$$
 (61)

Although a more recent value has been adopted [66, 69] it is the above value, consistent with the 1989 interim mass evaluation [18], that should be used if our calculated mass excesses in MeV are converted to atomic mass units.

2.5. Finite-range liquid-drop model

In the present version of our model the contribution to the atomic mass excess from the FRLDM macroscopic energy is given by

$$E_{\mathrm{mac}}^{\mathrm{FL}}(Z,N,\mathrm{shape}) =$$

$$M_{\mathrm{H}}Z + M_{\mathrm{n}}N \qquad \mathrm{mass\ excesses\ of\ } Z\ \mathrm{hydrogen\ atoms\ and\ } N\ \mathrm{neutrons}$$

$$- a_{\mathrm{v}} \left(1 - \kappa_{\mathrm{v}} I^{2}\right) A \qquad \mathrm{volume\ energy}$$

$$+ a_{\mathrm{s}} \left(1 - \kappa_{\mathrm{s}} I^{2}\right) B_{1} A^{2/3} \qquad \mathrm{surface\ energy}$$

$$+ a_{\mathrm{s}} \left(1 - \kappa_{\mathrm{s}} I^{2}\right) B_{1} A^{2/3} \qquad \mathrm{surface\ energy}$$

$$+ a_{\mathrm{o}} A^{0} B_{\mathrm{W}} \qquad A^{0}\ \mathrm{energy}$$

$$+ c_{1} \frac{Z^{2}}{A^{1/3}} B_{3} \qquad \mathrm{Coulomb\ exchange\ correction}$$

$$+ f(k_{f} r_{\mathrm{p}}) \frac{Z^{2}}{A} \qquad \mathrm{proton\ form\ factor\ correction\ to\ the\ Coulomb\ energy}$$

$$- c_{\mathrm{a}} (N - Z) \qquad \mathrm{charge\ -asymmetry\ energy}$$

$$+ W \left(|I| B_{\mathrm{W}} + \left\{ \begin{array}{c} 1/A \ , \ Z\ \mathrm{and\ } N\ \mathrm{odd\ and\ equal\ } \\ 0 \ , & \mathrm{otherwise} \end{array} \right) \qquad \mathrm{Wigner\ energy}$$

$$+ \left\{ \begin{array}{c} + \overline{\Delta}_{\mathrm{p}} + \overline{\Delta}_{\mathrm{n}} - \delta_{\mathrm{np}} \ , \ Z\ \mathrm{and\ } N\ \mathrm{odd} \\ + \overline{\Delta}_{\mathrm{p}} \ , \qquad Z\ \mathrm{odd\ and\ } N\ \mathrm{even} \end{array} \right.$$

$$+ \left\{ \begin{array}{c} + \overline{\Delta}_{\mathrm{p}} + \overline{\Delta}_{\mathrm{n}} - \delta_{\mathrm{np}} \ , \ Z\ \mathrm{odd\ and\ } N\ \mathrm{odd} \\ + 0 \ , \qquad Z\ \mathrm{and\ } N\ \mathrm{odd} \end{array} \right.$$

$$+ \left\{ \begin{array}{c} + \overline{\Delta}_{\mathrm{p}} \ , \qquad Z\ \mathrm{odd\ and\ } N\ \mathrm{even} \\ - a_{\mathrm{el}} Z^{2.39} \qquad \mathrm{energy\ of\ bound\ electrons}$$

This expression differs from the corresponding one used in our earlier FRLDM(1992) [9] only through the introduction of the shape-dependent factor B_W in the A^0 and Wigner terms.

For the average neutron pairing gap $\overline{\Delta}_n$, average proton pairing gap $\overline{\Delta}_p$, and average neutron-proton interaction energy δ_{np} we use [64, 65, 16]

$$\overline{\Delta}_{\rm n} = \frac{r_{\rm mac} B_{\rm s}}{N^{1/3}} \tag{63}$$

$$\overline{\Delta}_{p} = \frac{r_{\text{mac}}B_{s}}{Z^{1/3}} \tag{64}$$

$$\delta_{\rm np} = \frac{h}{B_{\rm s}A^{2/3}} \tag{65}$$

The zero reference point for the pairing energy corresponds to even-even nuclei rather than to halfway between even-even and odd-odd nuclei as has sometimes been the case previously [1, 2].

In the above expressions the quantities c_1 and c_4 are defined in terms of the electronic charge e and the nuclear-radius constant r_0 by

$$c_{1} = \frac{3}{5} \frac{e^{2}}{r_{0}}$$

$$c_{4} = \frac{5}{4} \left(\frac{3}{2\pi}\right)^{2/3} c_{1}$$
(66)

The quantity f appearing in the proton form-factor correction to the Coulomb energy is given by

$$f(k_{\rm F}r_{\rm p}) = -\frac{1}{8} \frac{r_{\rm p}^2 e^2}{r_0^3} \left[\frac{145}{48} - \frac{327}{2880} (k_{\rm F}r_{\rm p})^2 + \frac{1527}{1209600} (k_{\rm F}r_{\rm p})^4 \right]$$
(67)

where the Fermi wave number is

$$k_{\rm F} = \left(\frac{9\pi Z}{4A}\right)^{1/3} \frac{1}{r_0} \tag{68}$$

The relative neutron excess *I* is

$$I = \frac{N-Z}{N+Z} = \frac{N-Z}{A} \tag{69}$$

The relative surface energy B_s , which is the ratio of the surface area of the nucleus at the actual shape to the surface area of the nucleus at the spherical shape, is given by

$$B_{\rm s} = \frac{A^{-2/3}}{4\pi r_0^2} \int_{S} dS \tag{70}$$

The quantity B_1 is the relative generalized surface or nuclear energy in a model that accounts for the effect of the finite range of the nuclear force. It is given by

$$B_{1} = \frac{A^{-2/3}}{8\pi^{2}r_{0}^{2}a^{4}} \iint_{V} \left(2 - \frac{|\mathbf{r} - \mathbf{r}'|}{a}\right) \frac{e^{-|\mathbf{r} - \mathbf{r}'|/a}}{|\mathbf{r} - \mathbf{r}'|/a} d^{3}r d^{3}r'$$
(71)

The relative Coulomb energy B_3 is given by

$$B_{3} = \frac{15}{32\pi^{2}} \frac{A^{-5/3}}{r_{0}^{5}} \iint_{V} \frac{d^{3}r d^{3}r'}{|\mathbf{r} - \mathbf{r}'|} \left[1 - \left(1 + \frac{1}{2} \frac{|\mathbf{r} - \mathbf{r}'|}{a_{\text{den}}} \right) e^{-|\mathbf{r} - \mathbf{r}'|/a_{\text{den}}} \right]$$
(72)

For spherical shapes the quantities B_1 and B_3 can be evaluated analytically. With

$$x_0 = \frac{r_0 A^{1/3}}{a}$$
 and $y_0 = \frac{r_0 A^{1/3}}{a_{\text{den}}}$ (73)

one obtains

$$B_1^{(0)} = 1 - \frac{3}{x_0^2} + (1 + x_0) \left(2 + \frac{3}{x_0} + \frac{3}{x_0^2} \right) e^{-2x_0}$$

$$B_3^{(0)} = 1 - \frac{5}{y_0^2} \left[1 - \frac{15}{8y_0} + \frac{21}{8y_0^3} - \frac{3}{4} \left(1 + \frac{9}{2y_0} + \frac{7}{y_0^2} + \frac{7}{2y_0^3} \right) e^{-2y_0} \right]$$
 (74)

The expression B_3 for the relative Coulomb energy yields the energy for an arbitrarily shaped, homogeneously charged, diffuse-surface nucleus to all orders in the diffuseness constant a_{den} . The constants in front of the integrals for B_1 and B_3 have been chosen so that B_1 and B_3 are 1 for a sphere in the limit in which the range a and diffuseness a_{den} are zero, in analogy with the definition of the quantities B_s and B_c in the standard liquid-drop model.

Relative to the FRLDM(1992) model specification in Ref. [9] we have here introduced a shape-dependent factor $B_{\rm W}$ for the A^0 and Wigner terms. We have earlier pointed out that such a shape dependence is necessary to obtain continuity of the FRLDM potential energy at scission. For example, if in symmetric fission of ²⁶⁴Fm we treat the touching configuration of two symmetric spheres as a single deformed ²⁶⁴Fm system or as two touching ¹³²Sn nuclei a shape dependence is necessary to obtain continuity. This is discussed in detail in Refs. [52, 57, 70]. To discuss here the postulated shape dependence for the Wigner term that we have used since 1989 [52] we follow closely the discussion there. We note that in an extensive discussion of the Wigner term [8], it was pointed out that if a system is broken up into n identical pieces, then the Wigner term must be evaluated separately for each piece, with the result that it simply jumps to n times its original value. For symmetric fission into two identical fragments this simple argument would imply a shape dependence corresponding to a step function at scission. In reality one would expect that the step function is washed out over some range of shapes in the scission region. Obviously, if the area of a cross section in the neck region is very small then there is hardly any communication between the two fragments and we have essentially the two-system configuration. For cylinder-like shapes and those with even bulgier midsections, that is for shapes (in the three-quadratic-surface parameterizations) with $\sigma_2 \ge 0$, we clearly have a one-system configuration. How close we are to one or the other situation is related to the amount of communication through the neck. If the area of a cross section through the neck is S_3 and the area of the maximum cross section of the smaller one of the end bodies, that is a cross section through the center of the end surface of revolution, is S_1 , then we may relate the amount of communication to the dimensionless quantity S_3/S_1 . As a simple ansatz we propose the shape dependence

$$B_{W} = \begin{cases} \left(1 - \frac{S_{3}}{S_{1}}\right)^{2} a_{d} + 1 & , & \sigma_{2} \leq 0 \\ 1 & , & \sigma_{2} \geq 0 \end{cases}$$
 (75)

Suppose $a_d = 1.0$. Then, with the above shape dependence we would find that for scission shapes we have a Wigner term that is precisely two times the Wigner term for a single system. For cylinder-like configurations and for shapes

with thicker neck regions we would have a Wigner term that is equal to the term for a single shape. Thus, with the above shape dependence we obtain the desired values in the two limiting cases. However, at scission there is still *some* communication between the two fragments. This can be illustrated by considering the shell correction calculated by use of the Strutinsky method, for which we for symmetric configurations have a well-defined prescription, regardless of shape. For two touching 132 Sn nuclei we obtain a shell correction whose magnitude is about 10% lower than for two well-separated nuclei. This leads us to chose a value of $a_d = 0.9$ for the *damping* coefficient. We have actually calculated potential-energy surfaces and investigated their structure for other choices of the parameter a_d , which also occurs in the shape dependence of the A^0 term. From such studies it has turned out that the above value leads to potential-energy surfaces that when used in studies of 1) fission half-lives [52, 39], 2) fission-barrier heights across the nuclear chart, [57], 3) bimodal fission [52, 38], and 4) fission-fragment mass distributions [59] are in good agreement with experimental data for The uncertainty in the estimate of a_d from these studies is about 0.1. For the A^0 term we postulate the same shape dependence [52].

2.6. Values of FRLDM macroscopic-model constants

The constants appearing in the expression for the finite-range liquid-drop macroscopic model fall into four categories. The first category, which represents fundamental constants, includes [1, 2]

 $M_{\rm H} = 7.289034 \text{ MeV}$ hydrogen-atom mass excess $M_{\rm n} = 8.071431 \text{ MeV}$ neutron mass excess $e^2 = 1.4399764 \text{ MeV fm}$ electronic charge squared

The second category, which represents constants that have been determined from considerations other than nuclear masses, includes [1, 2]

a_{el}	=	1.433×10^{-5} 1	MeV	electronic-binding constant
r_{p}	=	0.80 f	fm	proton root-mean-square radius
r_0	=	1.16 f	fm	nuclear-radius constant
a	=	0.68 f	fm	range of Yukawa-plus-exponential potential
$a_{\rm den}$	=	0.70 f	fm	range of Yukawa function used to
				generate nuclear charge distribution

The third category, representing those constants whose values were obtained from consideration of odd-even mass differences [64, 65, 16] and other mass-like quantities, are

```
r_{\text{mac}} = 4.80 \text{ MeV} average pairing-gap constant

h = 6.6 \text{ MeV} neutron-proton interaction constant

W = 30 \text{ MeV} Wigner constant

a_{\text{d}} = 0.9 Wigner damping constant
```

It should be noted that the final calculated mass excess is strictly independent of the value used for $r_{\rm mac}$. This constant affects only the division of the mass excess between the macroscopic part and the remaining microscopic correction. We therefore do not include $r_{\rm mac}$ when we later count the number of constants in our mass model. It is the pairing constant $r_{\rm mic}$ which enters the microscopic model that affects the mass excess. It will be discussed below.

Since $\mu_{th} = 0$ in our case, Eqs. (6) and (8) can be solved with the experimental data set of 2149 masses with $Z \ge 8$ and $N \ge 8$ [17] and 31 fission-barrier heights to determine the remaining macroscopic constants and the error of our model. To present all the macroscopic model constants together we list them here but discuss their adjustment later. These constants are

$a_{\rm v}$	=	16.022835 M	ſeV	volume-energy constant
$\kappa_{\rm v}$	=	1.927910 M	ſeV	volume-asymmetry constant
$a_{\rm s}$	=	21.269461 M	l eV	surface-energy constant
$\kappa_{\rm s}$	=	2.388587 M	l eV	surface-asymmetry constant
a_0	=	2.649971 M	l eV	A^0 constant
$c_{\rm a}$	=	0.055673 M	ſeV	charge-asymmetry constant

The resulting error in the FRLDM is $\sigma_{th} = 0.6618$ MeV. We note that the constants have not changed very much, except possibly the charge-asymmetry constant which decreased to about half its value in the previous version in FRLDM(1992) [9] and in the FRLDM(2002) [57].

2.7. Microscopic model

The shell-plus-pairing correction $E_{s+p}(Z,N,shape)$ is the sum of the proton shell-plus-pairing correction and the neutron shell-plus-pairing correction, namely

$$E_{s+p}(Z, N, \text{shape}) = E_{s+p}^{\text{prot}}(Z, \text{shape}) + E_{s+p}^{\text{neut}}(N, \text{shape})$$
(76)

We give here the equations for the neutron shell-plus-pairing correction. Completely analogous expressions hold for protons. We have

$$E_{\text{s+p}}^{\text{neut}}(N, \text{shape}) = E_{\text{shell}}^{\text{neut}}(N, \text{shape}) + E_{\text{pair}}^{\text{neut}}(N, \text{shape})$$
(77)

Both terms are evaluated from a set of calculated single-particle levels. As before, the shell correction is calculated by use of Strutinsky's method [11, 12]. Thus

$$E_{\text{shell}}^{\text{neut}}(N, \text{shape}) = \sum_{i=1}^{N} e_i - \widetilde{E}^{\text{neut}}(N, \text{shape})$$
 (78)

where e_i are calculated single-particle energies and $\widetilde{E}^{\text{neut}}(N, \text{shape})$ is the smooth single-particle energy sum calculated in the Strutinsky method. The pairing correction is the difference between the pairing correlation energy and the average pairing correlation energy, namely

$$E_{\text{pair}}^{\text{neut}}(N, \text{shape}) = E_{\text{p.c.}}^{\text{neut}}(N, \text{shape}) - \widetilde{E}_{\text{p.c.}}^{\text{neut}}(N, \text{shape})$$
(79)

where $E_{\rm p.c.}^{\rm neut}(N,{\rm shape})$ is given by Eq. (101) and $\widetilde{E}_{\rm p.c.}^{\rm neut}(N,{\rm shape})$ is given by Eq. (108). For the pairing correction we now use the Lipkin-Nogami [13, 14, 15] version of the BCS method, which takes into account the lowest-order correction to the total energy of the system associated with particle-number fluctuation.

The single-particle potential felt by a nucleon is given by

$$V = V_1 + V_{\text{s.o.}} + V_{\text{C}} \tag{80}$$

The first term is the spin-independent nuclear part of the potential, which is calculated in terms of the folded-Yukawa potential

$$V_1(\mathbf{r}) = -\frac{V_0}{4\pi a_{\text{pot}}^3} \int_{\mathbf{V}} \frac{e^{-|\mathbf{r} - \mathbf{r}'|/a_{\text{pot}}}}{|\mathbf{r} - \mathbf{r}'|/a_{\text{pot}}} d^3 r'$$
(81)

where the integration is over the volume of the generating shape, whose volume is held fixed at $\frac{4}{3}\pi R_{\text{pot}}^3$ as the shape is deformed. The potential radius R_{pot} is given by

$$R_{\text{pot}} = R_{\text{den}} + A_{\text{den}} - B_{\text{den}} / R_{\text{den}}$$
(82)

with

$$R_{\rm den} = r_0 A^{1/3} (1 + \overline{\varepsilon}) \tag{83}$$

Values of the model constants A_{den} and B_{den} will be given later. The potential depths V_p for protons and V_n for neutrons are given by

$$V_{\rm p} = V_{\rm s} + V_{\rm a}\overline{\delta} \tag{84}$$

$$V_{\rm n} = V_{\rm s} - V_{\rm a} \overline{\delta} \tag{85}$$

The average bulk nuclear asymmetry $\bar{\delta}$ appearing in Eqs. (84) and (85) and average relative deviation $\bar{\epsilon}$ in the bulk of the density appearing in Eq. (83) are given by the droplet model and thus depend on the values of the droplet-model constants. The FRDM macroscopic constants are determined in a nonlinear least-squares adjustment, which requires between 1000 and 10000 steps to find the optimum constants. In principle, these constants should then be used in the determination of the single-particle potential, the potential-energy surfaces should be recalculated with the new constants, a new mass calculation should be performed, and a new set of macroscopic constants should be determined, with this iteration repeated until convergence. Any change of the single-particle potential would also make necessary a redetermination of the spin-orbit strength and the diffuseness. Because the calculation of potential-energy surfaces and other aspects of these steps would be very time-consuming, only one iteration has been performed. In our current mass calculation we have found additional evidence that the above form (and constants) of the single-particle potential are very satisfactory and we will comment further when we discuss the calculated results.

Furthermore, in determining the single-particle potential we have used the following early forms [71] of the droplet model expressions for $\bar{\delta}$ and $\bar{\epsilon}$:

$$\overline{\delta} = \left(I + \frac{3}{8} \frac{c_1}{Q} \frac{Z^2}{A^{5/3}}\right) / \left(1 + \frac{9}{4} \frac{J}{Q} \frac{1}{A^{1/3}}\right) \tag{86}$$

$$\overline{\varepsilon} = \left(-\frac{2a_2}{A^{1/3}} + L\overline{\delta}^2 + c_1 \frac{Z^2}{A^{4/3}} \right) / K \tag{87}$$

The range a_{pot} of the Yukawa function in Eq. (81) has been determined from an adjustment of calculated single-particle levels to experimental data in the rare-earth and actinide regions [37]. It is kept constant for nuclei throughout the periodic system.

The spin-orbit potential is given by the expression

$$V_{\text{s.o.}} = -\lambda \left(\frac{\hbar}{2m_{\text{nuc}}c}\right)^2 \frac{\sigma \cdot \nabla V_1 \times p}{\hbar}$$
(88)

where λ is the spin-orbit interaction strength, m_{nuc} is the nucleon mass, σ represents the Pauli spin matrices, and p is the nucleon momentum.

The spin-orbit strength has been determined from adjustments to experimental levels in the rare-earth and actinide regions. It has been shown [37, 1, 72] that many nuclear properties throughout the periodic system are well reproduced with λ given by a function linear in A through the values determined in these two regions. This gives

$$\lambda_{\rm p} = 6.0 \left(\frac{A}{240} \right) + 28.0 = 0.025A + 28.0 = k_{\rm p}A + l_{\rm p}$$
 (89)

for protons and

$$\lambda_{\rm n} = 4.5 \left(\frac{A}{240}\right) + 31.5 = 0.01875A + 31.5 = k_{\rm n}A + l_{\rm n} \tag{90}$$

for neutrons.

Finally, the Coulomb potential for protons is given by

$$V_{\rm C}(\mathbf{r}) = e\rho_{\rm c} \int_{\rm V} \frac{d^3 r'}{|\mathbf{r} - \mathbf{r}'|}$$
(91)

where the charge density ρ_c is given by

$$\rho_{\rm c} = \frac{Ze}{\frac{4}{3}\pi A r_0^3} \tag{92}$$

The basis functions used to generate the matrix elements of the single-particle Hamiltonian is a set of deformed, axially symmetric, harmonic-oscillator eigenfunctions, specifically all those that for a given shape have an energy less than or equal to $(N_{bas} + 0.5)\hbar\omega_0$. The overall curvature of the basis functions is chosen to yield

$$\hbar\omega_0 = C_{\rm cur}/A^{1/3} \tag{93}$$

2.8. Microscopic pairing models

Because of its basic simplicity, the BCS pairing model [73, 74, 75, 76] has been the pairing model of choice in most previous nuclear-structure calculations [77, 10, 1, 2]. However, a well-known deficiency of the BCS model is that for large spacings between the single-particle levels at the Fermi surface, no non-trivial solutions exist. In practical applications, these situations occur not only at magic numbers, but also, for example, for deformed actinide nuclei at neutron numbers N = 142 and 152. By taking into account effects associated with particle-number fluctuations, the Lipkin-Nogami approximation [13, 14, 15] goes beyond the BCS approximation and avoids such collapses.

In solving the pairing equations for neutrons or protons in either the BCS or Lipkin-Nogami model, we consider a constant pairing interaction G acting between $N_2 - N_1 + 1$ doubly degenerate single-particle levels, which are occupied by N_{int} nucleons. This interaction interval starts at level N_1 , located below the Fermi surface, and ends at level N_2 , located above the Fermi surface. With the definitions we use here, the levels are numbered consecutively starting with number 1 for the level at the bottom of the well. Thus, for even particle numbers, the last occupied levels in the neutron and proton wells are N/2 and Z/2, respectively.

The level pairs included in the pairing calculation are often chosen symmetrically around the Fermi surface. However, for spherical nuclei it is more reasonable to require that degenerate spherical states have equal occupation probability. This condition cannot generally be satisfied simultaneously with a symmetric choice of levels in the interaction region. We therefore derive the pairing equations below for the more general case of arbitrary N_1 and N_2 .

In the Lipkin-Nogami pairing model [13, 14, 15] the pairing gap Δ , Fermi energy λ , number-fluctuation constant λ_2 , occupation probabilities v_k^2 , and shifted single-particle energies ε_k are determined from the $2(N_2-N_1)+5$ coupled nonlinear equations

$$N_{\text{tot}} = 2\sum_{k=N_1}^{N_2} v_k^2 + 2(N_1 - 1)$$
(94)

$$\frac{2}{G} = \sum_{k=N_1}^{N_2} \frac{1}{\sqrt{(\varepsilon_k - \lambda)^2 + \Delta^2}} \tag{95}$$

$$v_k^2 = \frac{1}{2} \left[1 - \frac{\varepsilon_k - \lambda}{\sqrt{(\varepsilon_k - \lambda)^2 + \Delta^2}} \right], \quad k = N_1, N_1 + 1, \dots, N_2$$
 (96)

$$\varepsilon_k = e_k + (4\lambda_2 - G)v_k^2, \quad k = N_1, N_1 + 1, \dots, N_2$$
 (97)

$$\lambda_{2} = \frac{G}{4} \left[\frac{\left(\sum_{k=N_{1}}^{N_{2}} u_{k}^{3} v_{k}\right) \left(\sum_{k=N_{1}}^{N_{2}} u_{k} v_{k}^{3}\right) - \sum_{k=N_{1}}^{N_{2}} u_{k}^{4} v_{k}^{4}}{\left(\sum_{k=N_{1}}^{N_{2}} u_{k}^{2} v_{k}^{2}\right)^{2} - \sum_{k=N_{1}}^{N_{2}} u_{k}^{4} v_{k}^{4}} \right]$$
(98)

where

$$u_k^2 = 1 - v_k^2$$
, $k = N_1, N_1 + 1, \dots, N_2$ (99)

The quasi-particle energies E_k of the odd nucleon in an odd-A nucleus are now given by [14]

$$E_k = \left[(\varepsilon_k - \lambda)^2 + \Delta^2 \right]^{1/2} + \lambda_2, \quad k = N_1, N_1 + 1, \dots, N_2$$
 (100)

In the Lipkin-Nogami model it is the sum $\Delta + \lambda_2$ that is identified with odd-even mass differences [14]. We denote this sum by Δ_{LN} .

The pairing-correlation energy plus quasi-particle energy in the Lipkin-Nogami model is given by

$$E_{\text{p.c.}} = \sum_{k=N_1}^{N_2} (2v_k^2 - n_k)e_k - \frac{\Delta^2}{G} - \frac{G}{2} \sum_{k=N_1}^{N_2} (2v_k^4 - n_k) - 4\lambda_2 \sum_{k=N_1}^{N_2} u_k^2 v_k^2 + E_i \theta_{\text{odd}, N_{\text{tot}}}$$
(101)

where e_k are the single-particle energies and n_k , with values 2, 1, or 0, specify the sharp distribution of particles in the absence of pairing. The quasi-particle energy E_i for the odd particle occupying level i is given by Eq. (100), and $\theta_{\text{odd},N_{\text{tot}}}$ is unity if N_{tot} is odd and zero if N_{tot} is even.

2.9. Effective-interaction pairing-gap models

In microscopic pairing calculations, the pairing strength G for neutrons and protons can be obtained from effective-interaction pairing gaps Δ_{G_n} and Δ_{G_n} given by [16]

$$\Delta_{G_n} = \frac{r_{\text{mic}} B_s}{N^{1/3}} \tag{102}$$

$$\Delta_{G_p} = \frac{r_{\text{mic}}B_s}{Z^{1/3}} \tag{103}$$

The dependence of the pairing strength G on the corresponding effective-interaction pairing gap Δ_G is obtained from the microscopic equations by assuming a constant level density for the average nucleus in the vicinity of the Fermi surface. This allows the sums in the equations to be replaced by integrals. The average level density of doubly degenerate levels is taken to be

$$\widetilde{\rho} = \frac{1}{2}\widetilde{g}(\widetilde{\lambda}) \tag{104}$$

where \widetilde{g} is the smooth level density that is obtained in Strutinsky's shell-correction method and $\widetilde{\lambda}$ is the Fermi energy of the smoothed single-particle energy [10, 78]. Thus, we can make the substitution

$$\sum_{k=N_1}^{N_2} f(e_k - \lambda) \Longrightarrow \widetilde{\rho} \int_{y_1}^{y_2} f(x) dx \tag{105}$$

where

$$y_{1} = \frac{-\frac{1}{2}N_{\text{tot}} + N_{1} - 1}{\widetilde{\rho}}$$

$$y_{2} = \frac{-\frac{1}{2}N_{\text{tot}} + N_{2}}{\widetilde{\rho}}$$
(106)

The gap equation (95) can now be evaluated for an average nucleus, with the result

$$\frac{1}{G} = \frac{1}{2} \widetilde{\rho} \int_{y_1}^{y_2} \frac{dx}{\sqrt{x^2 + \Delta_G^2}} \\
= \frac{1}{2} \widetilde{\rho} \left[\ln \left(\sqrt{y_2^2 + \Delta_G^2} + y_2 \right) - \ln \left(\sqrt{y_1^2 + \Delta_G^2} + y_1 \right) \right]$$
(107)

From this expression, the pairing strength G in the BCS model can be determined in any region of the nuclear chart.

The same expression may also be used in the Lipkin-Nogami case, but some reinterpretations are necessary. It is now the energies ε_k occurring in Eq. (95) that are assumed to be equally spaced. These are not precisely the single-particle energies e_k but are related to them by Eq. (97). Thus, in order for ε_k to be equally spaced, the single-particle

energies e_k must be shifted downward by the amounts $(4\lambda_2 - G)v_k^2$. Since the occupation probability v_k^2 is approximately unity far below the Fermi surface and zero far above, the corresponding single-particle energy distribution is approximately uniform far above and far below the Fermi surface but spread apart by the additional amount $4\lambda_2 - G$ close to the Fermi surface. Although this decrease in level density near the Fermi surface is accidental, it is in approximate accord with the ground-state structure of real nuclei, since the increased stability associated with ground-state configurations is due to low level densities near the Fermi surface [78, 65].

In the Lipkin-Nogami model, it is the quantity $\Delta + \lambda_2$ that is associated with odd-even mass differences, whereas in the BCS model it is Δ only that should be directly compared to the experimental data. This leads to the expectation that there is a related difference between Δ_G^{LN} and Δ_G^{BCS} , the effective-interaction pairing gaps associated with the LN and BCS models, respectively. Since we determine the constants of the model for Δ_G^{LN} directly from least-squares minimization, it is not necessary to specify exactly such a relationship. However, the above observation is of value as a rough rule of thumb, and to remind us to expect that the effective-interaction pairing gaps in the BCS and LN models will be of somewhat different magnitude.

The expression for the *average* pairing correlation energy plus quasi-particle energy $\widetilde{E}_{p.c.}$ in the Lipkin-Nogami model is obtained in a similar manner as the expression for the pairing matrix element G. For the average pairing correlation energy plus quasi-particle energy in the Lipkin-Nogami model we then obtain

$$\widetilde{E}_{\text{p.c.}} = \frac{1}{2}\widetilde{\rho} \left[(y_2 - G) \left(y_2 - \sqrt{y_2^2 + \Delta_G^2} \right) + (y_1 - G) \left(y_1 + \sqrt{y_1^2 + \Delta_G^2} \right) \right]
+ \frac{1}{4} (G - 4\widetilde{\lambda}_2) \widetilde{\rho} \Delta_G \left[\tan^{-1} \left(\frac{y_2}{\Delta_G} \right) - \tan^{-1} \left(\frac{y_1}{\Delta_G} \right) \right] + \overline{\Delta} \theta_{\text{odd}, N_{\text{tot}}}$$
(108)

where the average pairing gap $\overline{\Delta}$ is given by Eqs. (41) and (42) or Eqs. (63) and (64).

The expression for λ_2 for an average nucleus is fairly lengthy, being given by

$$\widetilde{\lambda}_2 = \frac{G}{4} \left(\frac{A - C}{B - C} \right) \tag{109}$$

where

$$A = \left(\frac{\widetilde{\rho}\Delta_G}{4}\right)^2 \left\{ \left(\frac{2}{G\widetilde{\rho}}\right)^2 - \left[\ln\left(\frac{\sqrt{y_2^2 + \Delta_G^2}}{\sqrt{y_1^2 + \Delta_G^2}}\right)\right]^2 \right\}$$

$$B = \frac{\Delta_G^2 \widetilde{\rho}^2}{16} \left[\tan^{-1}\left(\frac{y_2}{\Delta_G}\right) - \tan^{-1}\left(\frac{y_1}{\Delta_G}\right)\right]^2$$

$$C = \frac{\widetilde{\rho}\Delta_G}{32} \left[\Delta_G\left(\frac{y_2}{y_2^2 + \Delta_G^2} - \frac{y_1}{y_2^2 + \Delta_G^2}\right) + \tan^{-1}\left(\frac{y_2}{\Delta_G}\right) - \tan^{-1}\left(\frac{y_1}{\Delta_G}\right)\right]$$
(110)

One should note that the pairing strength G depends on the interval (N_1,N_2) over which the pairing force is active. However, in our formulation we do not use G as a primary constant. Instead, we use the effective-interaction pairing gaps Δ_{G_n} and Δ_{G_p} , which are independent of the choice of interaction interval (N_1,N_2) . We choose the pairing interaction interval so that at least all levels up to 5 MeV above the Fermi surface are included. It has sometimes been asked whether particles scattered into the continuum by the pairing force would escape from the nucleus if the interaction interval includes unbound states. Of course not! The superfluid state is the *most bound* configuration. The single-particle picture does not give the true nuclear ground or excited states; it only serves as the set of basis functions for the pairing calculation. Instead, the quasi-particle energies obtained in the pairing calculation represent a subset of all possible excited states. If, in an excited nucleus, the quasi-particle energies are lower than the particle separation energies, no nucleons escape.

2.10. Shell correction

The Strutinsky shell-correction method [11, 12] requires two additional constants, the order p and the range γ_s . The shell correction should be insensitive to these quantities within a certain range of values. Their values can therefore be determined in principle by requiring this "plateau condition" to be fulfilled, that is that the shell correction is constant for a range of these quantities [11, 12]. We have found that for heavy nuclei this condition is indeed fulfilled, with the shell correction for nuclear ground-state shapes being insensitive to the values of these two constants. However, for light nuclei this is no longer the case. Here the shell correction may vary by several MeV for a reasonable range of values of the range γ_s . Moreover, the shell correction often does not exhibit any plateau. This probably indicates a gradual breakdown of the shell-correction method as one approaches the very lightest region of nuclei, where the number of single-particle levels is small, as was also discussed earlier, see Ref. [10] and references therein.

In the present calculation we retain the same values of the order in the Strutinsky shell-correction method and the range χ_s as in Ref. [9]. The range is expressed as

$$\gamma_{\rm S} = C_{\rm S} \hbar \omega_0 B_{\rm S} \tag{111}$$

with B_s given by Eq. (70).

The version of the Strutinsky method [11, 12] that we use here was originally proposed for infinite single-particle wells. For finite wells the calculated shell correction diverges to $+\infty$ as the number of basis functions approaches $+\infty$. This difficulty is avoided by using only a limited number of basis functions. It has been found that the calculated shell correction is approximately independent of N_{bas} in the range $8 \lesssim N_{\text{bas}} \lesssim 13$ [10].

One may expect the Strutinsky method to be less accurate for light nuclei than for heavy nuclei because the smooth, average quantities calculated in the Strutinsky method are less accurately determined from the few levels occurring in light nuclei. One could also ask if the method is less accurate near the drip lines than close to β stability because the truncated single-particle level spectrum that we use deviates more from a realistic single-particle spectrum near the drip lines than near β -stable nuclei. Below, where we study the reliability of the model for light nuclei and for nuclei far from β stability, we find that the model error does indeed grow as the size of the nuclear system decreases. However, we find no obvious increase in the model error for today's known nuclei that are the furthest from β stability. The reliability of the Strutinsky method for the folded-Yukawa single-particle potential is further discussed in the appendix of Ref. [10].

2.11. Zero-point energy

As a final step in the calculation of nuclear ground-state masses, a zero-point energy is added to the calculated potential energy at the ground-state shape. In the FRDM(1992) calculation, only a contribution from zero-point motion in the ε_2 (fission) direction was added because we could not calculate the potential versus the axial asymmetry direction at that time. Since we now have that capability we also consider zero-point motion in the axial-asymmetry variable.

In the harmonic approximation this zero-point energy E_{zp} is given by

$$E_{0,\lambda} = \frac{1}{2}\hbar\omega_{\lambda} \tag{112}$$

where

$$\omega_{\lambda} = (C_{\lambda}/B_{\lambda})^{1/2} \tag{113}$$

Here C_{λ} is the potential-energy stiffness constant and B_{λ} is the inertia associated with motion in the λ -direction. We assume here that the inertia B_{λ} is proportional to the incompressible irrotational flow, with the same proportionality factor for both ε - and γ -vibrations. We write this relationship in the form

$$B_{\lambda} = B_{\lambda}^{\text{irr}} / \mathcal{K}^2 \tag{114}$$

so that

$$\omega_{\lambda} = \mathscr{K} \omega_{\lambda}^{\text{irr}} \tag{115}$$

Since a realistic inertia is larger than the irrotational flow inertia we determine \mathcal{K} in our adjustment of the other FRDM parameters to ground-state masses. We then use the same value of \mathcal{K} in the FRLDM model.

The incompressible-flow values of the inertias for axially symmetric shapes are given by [1]:

$$B_{\varepsilon_2}^{\text{irr}} = \frac{2}{15} \frac{\left(1 + \frac{2}{9}\varepsilon_2^2\right)}{\left(1 - \frac{2}{3}\varepsilon_2\right)^2} \left(1 - \frac{1}{3}\varepsilon_2^2 - \frac{2}{27}\varepsilon_2^3\right)^{-4/3} M_0 R_0^2$$
(116)

$$B_{\gamma}^{\text{irr}} = \frac{2}{15} \left(\frac{1 - \frac{2}{3} \varepsilon_2}{1 + \frac{1}{3} \varepsilon_2} \right)^{2/3} \left[\ln \left(\frac{1 + \frac{1}{3} \varepsilon_2}{1 - \frac{2}{3} \varepsilon_2} \right) \right]^2 M_0 R_0^2$$
 (117)

The stiffness constants C_{λ} are determined from the curvatures with respect to ε_2 and γ

$$C_{\gamma} = \frac{\partial^2 E}{\partial \gamma^2} \bigg|_{gs}$$
 $C_{\varepsilon_2} = \frac{\partial^2 E}{\partial \varepsilon_2^2} \bigg|_{gs}$ (118)

At the ground state we obtain the harmonic approximation to the potential energy by fitting a second-degree polynomial to the potential. Earlier we used only three points, the ground-state and one point on either side [9]. Now, in the ε parameterization we use potential energies at $\varepsilon_2^{gs}, \varepsilon_2^{gs} \pm 0.05, \varepsilon_2^{gs} \pm 0.10$, and $\varepsilon_2^{gs} \pm 0.15$, that is, seven points to do a least-squares fit of a second-degree polynomial to these points. In the γ direction we use $\gamma^{gs}, \gamma^{gs} \pm 5, \gamma^{gs} \pm 10$, and $\gamma^{gs} \pm 15$. For the 746 cases when the ground state is tri-axial, we obtain the inertias by interpolation between the their values on the prolate and oblate axes. As discussed in Ref. [1], as ε_2 goes to zero the ε_2 and γ modes become identical. Also, for small distances away from the spherical shape, it is numerically difficult to calculate ΔE_{γ} , so for ground states with $\varepsilon_2 < 0.17$ we put $\Delta E_{\gamma} = \Delta E_{\varepsilon_2}$.

2.12. Values of microscopic-model constants

The constants appearing in the expressions occurring in the microscopic shell-plus-pairing calculation fall into four categories. The first category, which represents fundamental constants, includes

 $m_{
m nuc} = 938.90595 \text{ MeV}$ nucleon mass $\hbar c = 197.32891 \text{ MeV fm}$ Planck's constant multiplied by the speed of light and divided by 2π $e^2 = 1.4399764 \text{ MeV fm}$ electronic charge squared

The electronic charge squared has already been counted among the macroscopic constants.

The second category, which represents constants that have been determined from considerations other than nuclear masses, includes [1, 2, 10]

C_{cur}	=	41 MeV	basis curvature constant
$V_{ m s}$	=	52.5 MeV	symmetric potential-depth constant
$V_{\rm a}$	=	48.7 MeV	asymmetric potential-depth constant
$A_{\rm den}$	=	0.82 fm	potential radius correction constant
B_{den}	=	0.56fm^2	potential radius curvature-correction constant
$a_{\rm pot}$	=	0.8 fm	potential diffuseness constant
$k_{ m p}$	=	0.025	proton spin-orbit A coefficient
$l_{ m p}$	=	28.0	proton spin-orbit constant
$k_{\rm n}$	=	0.01875	neutron spin-orbit A coefficient
$l_{\rm n}$	=	31.5	neutron spin-orbit constant

The third category, representing those constants whose values were obtained from consideration of mass-like quantities, are

 $N_{\text{bas}} = 12$ number of basis functions p = 8 order of Strutinsky shell correction $C_{\text{S}} = 1.0$ Strutinsky range coefficient

The fourth category, representing those constants whose values were obtained from a least-squares adjustment simultaneously with the macroscopic constants of the FRDM, are

 $r_{
m mic} = 3.2 \ {
m MeV}$ LN effective-interaction pairing-gap constant ${\cal K} = 0.2475$ Zero-point energy constant

The constant r_{mic} was determined during the development of FRDM(1992) [9] and we have retained the value determined there.

In addition, the following droplet-model constants, which have been determined in an earlier study [71], are used in the expressions for the *average* bulk nuclear asymmetry $\overline{\delta}$ and *average* relative deviation $\overline{\varepsilon}$ in the bulk density that are used to calculate V_p , V_n , and R_{den} in Eqs. (84), (85), and (83), respectively:

 a_2 = 22.00 MeV surface-energy constant J = 35 MeV symmetry-energy constant L = 99 MeV density-symmetry constant Q = 25 MeV effective surface-stiffness constant K = 300 MeV compressibility constant C = 1.16 fm nuclear-radius constant

Insertion of these values and the value of e^2 on which c_1 depends in Eqs. (86) and (87) leads to

$$\overline{\delta} = \frac{(N-Z)/A + 0.0112Z^2/A^{5/3}}{1 + 3.15/A^{1/3}}$$
(119)

$$\overline{\varepsilon} = -\frac{0.147}{A^{1/3}} + 0.330\overline{\delta}^2 + \frac{0.00248Z^2}{A^{4/3}}$$
 (120)

3. ENUMERATION OF CONSTANTS

It is always of interest to have a clear picture of exactly what constants enter a model. Naturally, anyone who sets out to verify a calculation by others or uses a model for new applications needs a complete specification of the model, for which a full specification of the constants and their values is an essential part. Also, when different models are compared it is highly valuable to fully understand exactly what constants enter the models. Unfortunately, discussions of model constants are often incomplete, misleading, and/or erroneous. For example, in Table A of Ref. [79] the

Table A

Constants in the FRDM. The third column gives the number of constants adjusted to nuclear masses or mass-like quantities such as odd-even mass differences or fission-barrier heights. The fourth column gives the number of constants determined from other considerations.

Constants	Comment	Mass-like	Other
$M_{\rm H}, M_{\rm n}, e^2$	Macroscopic fundamental constants	0	3
$a_{\text{el}}, r_0, r_{\text{p}}, a, a_{\text{den}}, K$	Macroscopic constants from considerations other than mass-like data	0	6
a_3, W, h	Macroscopic constants obtained in prior adjustments to mass-like data	3	0
$a_1, a_2, J, Q, a_0, L, C, \gamma, c_a$	Macroscopic constants determined by current least-squares adjustments	9	0
$\hbar c$, $m_{ m nuc}$	Microscopic fundamental constants	0	2
V_s , V_a , A_{den} , B_{den} , C_{cur} , k_p , l_p , k_n , l_n , a_{pot}	Microscopic constants	0	10
$N_{\rm bas},p,C_{\rm S}$	Microscopic constants determined from considerations of mass-like quantities	3	0
$r_{\rm mic}$,	Microscopic constant determined by previous least-squares adjustments	1	0
${\mathscr K}$	Microscopic constant determined by current least-squares adjustments	1	0
a_1, a_2, J, K, L, Q	Droplet-model constants that enter the single- particle potential (see discussion in text)	0	0
Subtotals		17	21
Total			38

number of parameters of the mass model of Spanier and Johansson [80] is listed as 12. However, in the article [80] by Spanier and Johansson, the authors themselves list in their Table A 30 parameters plus 5 magic numbers that are not calculated within the mass model and must therefore be considered parameters, for a total of at least 35 parameters.

We specify here *all* the constants that enter our model, rather than just those that in the final step are adjusted to experimental data by a least-squares procedure. We also include such constants as the number of basis functions used and fundamental constants like the electronic charge and Planck's constant.

3.1. Constants in the FRDM

The discussion in the previous section allows us to enumerate the constants in the FRDM model in Table A. From this list we see that the macroscopic-microscopic method requires relatively few constants. One feature of the model gives rise to a small complication when counting the number of constants. Droplet-model constants occur also in the determination of the single-particle potential. However, a different set of constants is used here because, as discussed above, one does not know what the optimum values are until the calculation has been completed. In principle, the calculation should be repeated with the new droplet-model constants defining the single-particle potential until convergence is obtained. In Table A we have counted the number of constants as if this procedure had been carried out.

However, since the droplet-model constants used in the present calculations are different in the microscopic part and in the macroscopic part, different counting schemes could also be employed. Since the droplet-model constants used in the microscopic expressions are obtained from four primary constants [71] and nuclear masses were used only to give rough estimates of these constants, one may not wish to regard them as determined from mass-like quantities. One of the four primary constants is the nuclear radius constant r_0 , which has the same value as we use in our macroscopic model. Therefore, only three remain that could be considered as additional FRDM constants. With this classification scheme the number of constants adjusted to mass-like quantities remains 17 and the total number of constants in the model increases from 38 to 41. Alternatively, if we do count the three primary constants as adjusted to nuclear masses, the total number of FRDM constants is 41, while the number adjusted to mass-like quantities increases from 17 to 20.

Table B

Constants in the FRLDM. The third column gives the number of constants adjusted to nuclear masses or mass-like quantities such as odd-even mass differences or fission-barrier heights. The fourth column gives the number of constants determined from other considerations.

Constants	Comment	Mass-like	Other
$M_{\rm H}, M_{\rm n}, e^2$	Macroscopic fundamental constants	0	3
$a_{\rm el}$, r_0 , $r_{\rm p}$, a , $a_{\rm den}$	Macroscopic constants from considerations other than mass-like data	0	5
W, h	Macroscopic constants obtained in prior adjustments to mass-like data	2	0
$a_{\text{V}}, \kappa_{\text{V}}, a_{\text{S}}, \kappa_{\text{S}}, a_{0}, c_{\text{a}}$	Macroscopic constants determined by current least-squares adjustments	6	0
$\hbar c, m_{ m nuc}$	Microscopic fundamental constants	0	2
V_s , V_a , A_{den} , B_{den} , C_{cur} , k_p , l_p , k_n , l_n , a_{pot}	Microscopic constants	0	10
$N_{\mathrm{bas}}, p, C_{\mathrm{S}}, r_{\mathrm{mic}}, \mathcal{K}$	Microscopic constants determined from considerations of mass-like quantities	4	0
a_1, a_2, J, K, L, Q	Droplet-model constants that enter the single- particle potential (see discussion in text)	3	0
Subtotals		16	20
Total			36

3.2. Constants in the FRLDM

The constants in the FRLDM, which are either identical to or similar to the constants in the FRDM, are enumerated in Table B. We mentioned in the discussion of the FRDM constants that the six constants in the last line of Table A would converge to the values of the same constants listed earlier in the table after a sufficient number of iterations. In the FRDM these constants therefore need not be regarded as additional constants. In contrast, in the FRLDM they must be regarded as constants obtained from adjustments to mass-like quantities. However, as mentioned in the discussion of the FRDM constants, these constants are all obtained from three primary constants, so we only include three in this category.

4. CALCULATIONAL DETAILS

Our mass tabulation includes all nuclei in the FRDM(1992) and 339 additional nuclei requested by astrophysicists: below N=82 we have added nuclei on the neutron-rich side, up to about 20 in each isotope sequence. For example, the most neutron-rich chromium nucleus in the previous table was $^{86}_{24}\text{Cr}_{62}$, in the current table it is $^{103}_{24}\text{Cr}_{79}$. We refer below to this "new" neutron-rich region as NNR.

The adjustment of constants in the macroscopic model is simplified enormously because the ground-state shape and fission saddle-point shape are to high accuracy independent of the precise values of these constants when they are varied within a reasonable range [82]. We therefore calculate the ground-state deformation with one set of constants and subsequently determine the various shape-dependent terms in the mass expression at this deformation. The constants of the macroscopic model can then be adjusted, with the nuclear shapes remaining fixed. The ground-state shapes are always determined in the FRLDM.

A significant advantage of this approach is that the effect of new features can often be investigated without repeating the entire calculation from the beginning. With the more elaborate searches for ground-state minima relative to the FRDM(1992) (see below) and the consideration of axial-asymmetry effects that we now undertake, this would take around 50000 CPU hours, of which about 40000 CPU hours comes from the consideration of axial-asymmetry degrees of freedom. Our determination of mass-model constants and ground-state nuclear masses involves several steps that were summarized in Fig 1. We discuss these steps and then continue with a presentation and discussion of our results.

1. We found, when we could profit from vastly increased computer power, that in the optimization of the FRDM(1992) macroscopic constants we had not quite found the optimum values. We had started with about 20 different starting values for these constants and we always converged on the same solution. We later found, as discussed in Ref. [83], that when we investigated a larger set of starting values, several hundred sets, about 5% would lead to a different, lower- σ_{th} solution, namely $\sigma_{th} = 0.6614$ MeV. It is interesting to note that when we compare

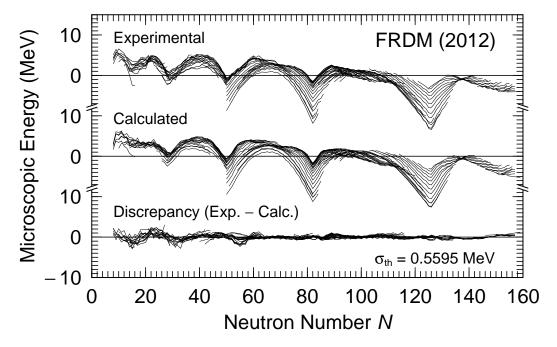


Fig. 3: Comparison of experimental and calculated microscopic energies $E_{\rm mic}$ for 2149 nuclei, for a macroscopic model corresponding to the FRDM. The bottom part showing the difference between these two quantities is equivalent to the difference between measured and calculated ground-state masses. There are almost no systematic errors remaining for nuclei with $N \ge 65$, for which region the error is only 0.355 MeV. The results shown in this figure represent our new mass model. The lines are drawn through isotope chains.

the published FRDM(1992) to the masses that were new in AME2003 relative to AME1989 (529 data points, we found that in this "extrapolated" region the model error was quite low $\sigma_{th}=0.4617$ MeV. With the more optimized model constants one would perhaps expect poorer extrapolation properties, since conventional wisdom is that a model that is extremely tightly bound to known data will do more poorly when applied to new regions. However, we found that the model with the better determined constants reproduced the masses in the new region with a $\sigma_{th}=0.4208$ MeV accuracy! These investigations are discussed in slightly more detail in Ref. [83]. Since we had by then realized that the FRDM should not be applied to fission barrier calculations

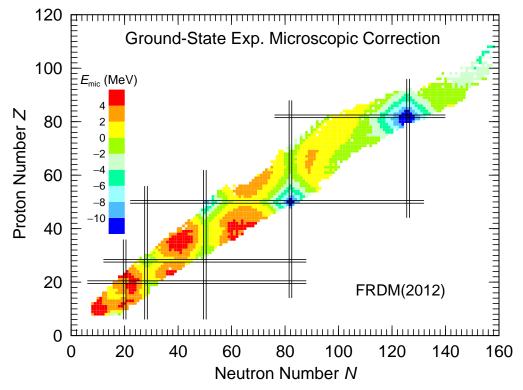


Fig. 4: Experimental microscopic correction corresponding to the top section in Fig. 3.

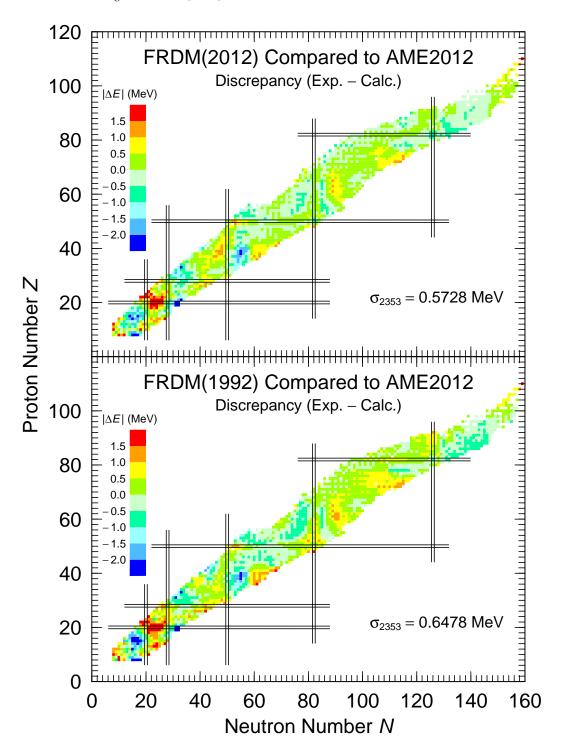


Fig. 5: Top Panel: Difference between measured masses and masses calculated in our current FRDM(2012). The model is adjusted to the AME2003 experimental evaluation [17] but we compare to the AME2012 evaluation [81]. Bottom panel: The previous FRDM(1992) is compared to the same data evaluation. The figure is discussed further in the text.

we also investigated the impact of excluding them from our optimization of model constants. This led to a very minimal decrease in the model deviations, we obtained $\sigma_{th}=0.6591$ MeV. We also investigated the results obtained when we adjusted to the AME2003 data base (which we also now do here) and obtained a model error $\sigma_{th}=0.6140$ MeV. Thus, as indicated in the summary Fig. 1 we obtained an improvement of (about) 0.05 MeV from these two enhancements. We now proceed to discuss the remaining steps.

2. As a first step, potential-energy surfaces are calculated versus ε_2 , ε_4 , and γ . In this calculation, which was actually performed in 2006, the FRLDM as defined in Ref. [9], with macroscopic constants as given in Ref. [57], was used. From these potential-energy surfaces a first estimate of the ground-state ε_2 , ε_4 and γ deformations are obtained. The grid-point distances are $\Delta\varepsilon_2 = 0.025$, $\Delta\varepsilon_4 = 0.02$, and $\Delta\gamma = 2.5$. Details of these calculations are in Refs. [44, 45, 39, 25]. A large number of calculated potential-energy surfaces and discussions focused on shape isomers are in Ref. [46]. Calculated potential-energy surfaces in .pdf format can be accessed at URL [84].

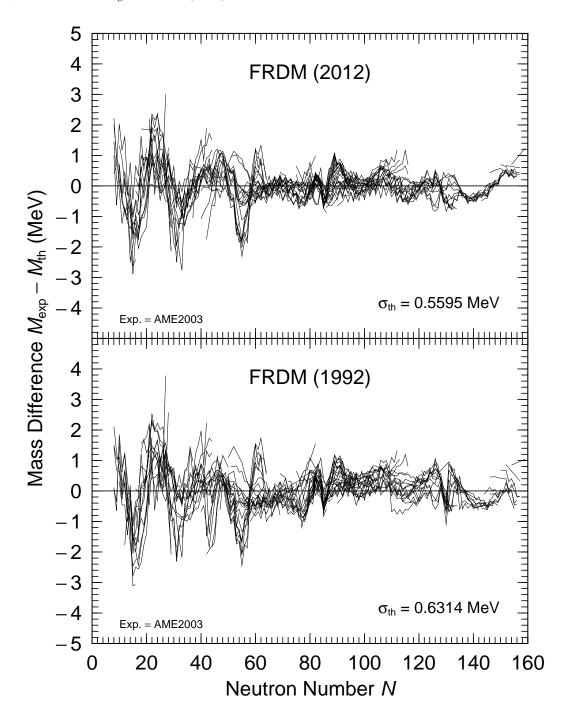


Fig. 6: Experiment compared to FRDM(1992) and FRDM(2012). The improvements are particularly noticeable near the magic numbers N = 82 and N = 126 and in the shape-coexistence region near N = 40.

They should be accessed by following the link "here" at the top of this page. Two sets of surfaces exist. One set is limited in deformations to $0 \le \varepsilon_2 \le 0.45$ and $31 \le A \le 290$ "near-ground-state" potential-energy surfaces; the other to $0 \le \varepsilon_2 \le 0.75$ and $171 \le A \le 330$, so called "fission" potential-energy surfaces. Axial asymmetry was not considered for NNR nuclei, because the request for additional nuclei came 5 years after we had concluded the axial-asymmetry studies. But since deformations in the NNR are usually near spherical and because axial asymmetry is minor for lighter and neutron-rich nuclei (see Fig. 2 in Ref. [44]) we expect little effect on masses from this omission.

3. In our implementation of axial asymmetry we can only study axial asymmetry together with two other multipoles, namely quadrupole (ε_2) and hexadecapole (ε_4) multipoles. The largest effect on the ground state mass that we find in that study is about 0.8 MeV. Only about 10% of the nuclei are affected, usually to a much smaller degree, see Refs. [44, 45]. To calculate more accurate ground-state shapes and masses for axially symmetric nuclei we proceed as follows. We minimize the energy with respect to ε_2 , ε_3 , ε_4 , and ε_6 . We do a discrete minimization with a step size of 0.01 in each variable. We feel that a determination of the ground-state shapes to an accuracy of 0.01 in each of the four multipoles is quite sufficient, so that little would be gained by implementing cumbersome interpolation schemes. For each nucleus we do a minimization using several different starting

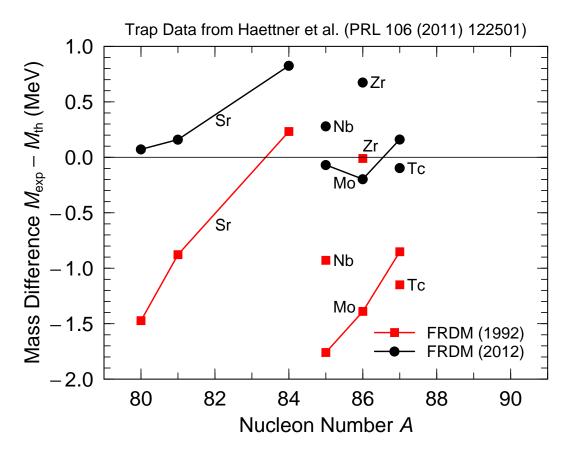


Fig. 7: Recent trap measurements [85] of 9 masses compared to FRDM(1992) and FRDM(2012). The new, more elaborate and accurate calculations have led to much better agreement with experimental masses in this region of shape coexistence.

points. One group of starting points are all the minima on the oblate and prolate axes that we found in the 3D calculation. We also start from the five locations ($\varepsilon_2 = -0.25, \varepsilon_3 = 0, \varepsilon_4 = -0.04, \varepsilon_6 = 0$), ($\varepsilon_2 = -0.25, \varepsilon_3 = 0, \varepsilon_4 = -0.04, \varepsilon_6 = 0$), ($\varepsilon_2 = +0.25, \varepsilon_3 = 0, \varepsilon_4 = -0.04, \varepsilon_6 = 0$), ($\varepsilon_2 = +0.25, \varepsilon_3 = 0, \varepsilon_4 = +0.04, \varepsilon_6 = 0$), and ($\varepsilon_2 = +0, \varepsilon_3 = 0, \varepsilon_4 = 0, \varepsilon_6 = 0$). During these studies we were surprised to discover that in a few rare cases (10 or 20 or so) that there could be a minimum with $\varepsilon_3 \neq 0$ separated from a minimum at $\varepsilon_3 = 0$ by a saddle in this 4D deformation space. What is also interesting is that we observed that if the octupole-deformed minimum was the lower of the two it would also correspond to a theoretical mass that agreed better with experiment. One example for which this occurs is ε_2^{28} Th. Typically these situations occur in the transition regions between octupole-asymmetric regions and octupole-symmetric regions on the heavy side of the octupole-asymmetric regions. We therefore also did minimizations with all of the above starting points but with $\varepsilon_3 = 0.10$ at the starting location.

- 4. Once the ground-state shapes in the 4D axially symmetric calculation have been determined, the various shape-dependent functions occurring in the macroscopic energy are calculated for these shapes and stored. The shell-plus-pairing corrections are also stored. Because we cannot calculate the FRDM shape-dependent parameters in the γ plane we account for the axial asymmetry effects on the ground-state mass in the following manner. All the tabulated quantities are for the (lowest) minima in the axially symmetric space, and we account for the effect of axial asymmetry by modifying the calculated shell corrections by the difference between the potential energy at the ground-state minimum in the $(\varepsilon_2, \varepsilon_3, \varepsilon_4, \varepsilon_6)$ space and the minimum in the $(\varepsilon_2, \varepsilon_4, \gamma)$ if the axially asymmetric minimum is the lower one. The zero-point energies are now also calculated as described above and stored as separate entries.
- 5. The above rule that we select as the ground state the lowest minimum has to be modified for heavy nuclei. Simply expressed, for a nuclide with a high proton number the "fission-isomer" minimum can be lower than a less deformed "ground state" but the fission isomer minimum can have a much lower barrier with respect to fission than does the less deformed minimum, so the fission-isomer minimum is not a minimum that is sufficiently stable to be observed. We therefore need the auxiliary rule that we check the barrier with respect to fission and select as the ground state the minimum with the highest barrier with respect to fission. This consideration only leads to a different selection for the ground state than the much simpler rule to pick the lowest minimum for a few nuclei near 228 Fm and for some heavier nuclei, in particular those with Z > 114 and N > 184. These issues are discussed in detail and pedagogically illustrated in section III:F "Identifying the ground-state" in Ref. [39] and in the discussion of Figs. 6 and 8 in Ref. [61].
- 6. The constants of the FRDM are now determined by the optimization procedure described in Sec. 2.1. We

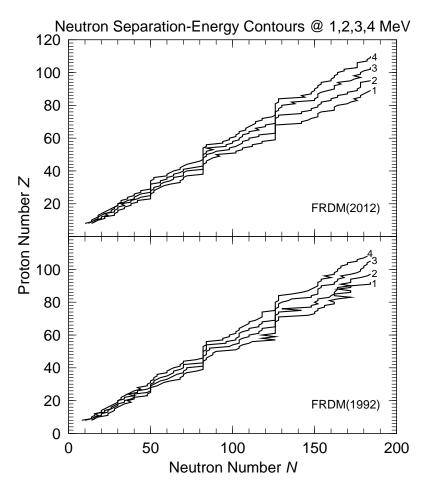


Fig. 8: Neutron separation-energy contours with $S_n = 1, 2, 3$, and 4 MeV in the FRDM(1992) and FRDM(2012). Most of the staggering in the contour lines seen for FRDM(1992) are absent in the FRDM(2012) results.

assume the mean μ_{th} is zero; thus we need only Eqs. 8, 9, 11, and 12. With all the shape-dependent macroscopic functions calculated and tabulated, and with the ground-state shell-plus-pairing energies and zero-point energies also tabulated, the actual optimization takes only 10 seconds or so to determine the optimum macroscopic constants. Once the constants are known (and all the tabulated quantities available) the FRDM(2012) is obtained

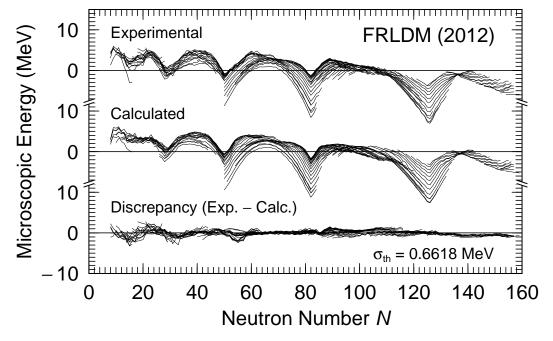


Fig. 9: Analogous to Fig. 3, but for the FRLDM, which contains no Coulomb redistribution terms. This leads to the systematic negative deviations for proton-rich nuclei in the heavy region, which indicate that these calculated masses are systematically too high.

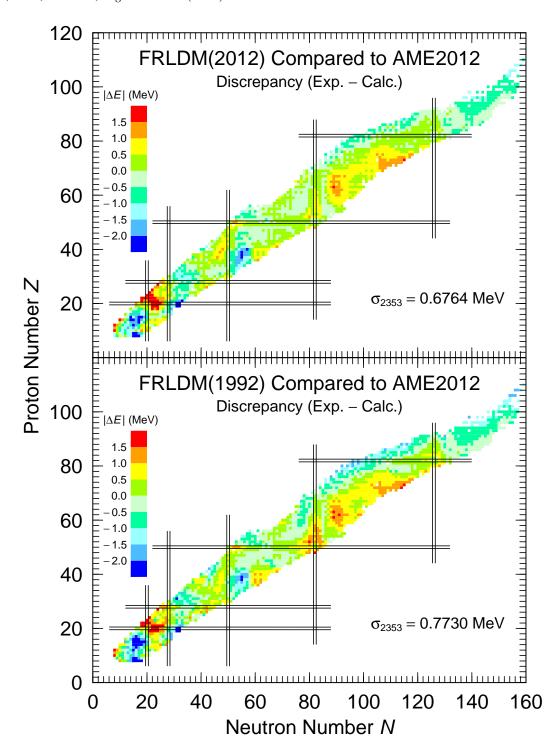


Fig. 10: Top panel: Difference between experimental masses and masses calculated in the FRLDM(2012). Bottom panel: We compare here the previous FRLDM(1992) to the same experimental data evaluation.

- in less than 10 seconds in the final computational step.
- 7. In the FRLDM we can calculate fission barriers. Therefore we determine the parameters by minimizing a weighted mean of the rms mass deviation and barrier rms deviations. with the weight 0.888 on the mass rms deviation and 0.111 on the barrier rms deviation. In case of multiple-humped fission barriers we only adjust to the outermost peak. In case of a triple-humped barrier we select the higher of the two outer peaks.
- 8. The FRLDM(2012) mass table is generated as well a barrier table with barrier heights for the 31 nuclei that we included in the barrier adjustment.

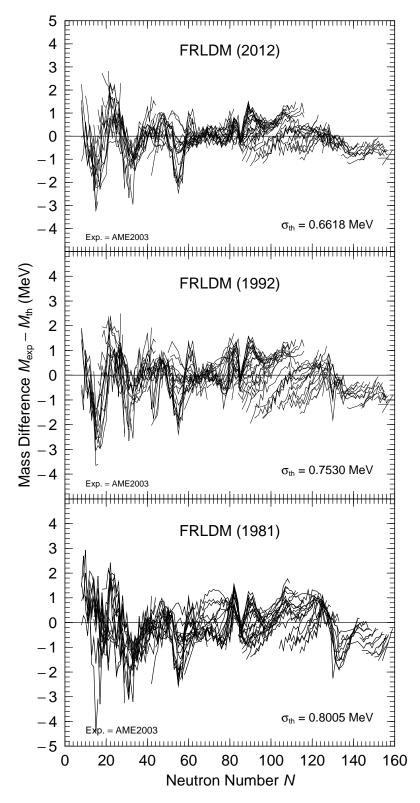


Fig. 11: Difference between measured masses and masses calculated in the FRLDM(2012) (top panel) and masses calculated in the FRLDM(1992) (middle panel). The regions of improvement resemble those of the FRDM, namely we find improvements in the regions near N = 40, N = 82, and N = 126. The deviations from experiment are larger than in the FRDM in the heavy region. In the bottom panel we compare our first mass model, the FRLDM(1981) to the same mass evaluation.

5. CALCULATED RESULTS

Figure 3 shows the results of the FRDM calculation. As usual [8, 1, 9], the top part shows the differences between measured masses and the calculated spherical macroscopic FRDM masses plotted against the neutron number N, with isotopes of a particular element connected by a line. These differences have customarily been called "experimental" microscopic corrections and can be compared with the calculated microscopic corrections plotted in the middle part of the figure. It should be noted that despite the designation "experimental microscopic corrections" these do depend

Table C
Comparison of Fission Barriers Calculated in the FRLDM(2012) and Experimental Barriers for 31 Nuclei

70	$E_{\rm exp}$ (MeV)	$E_{\rm th}$ (MeV)	ΔE (MeV)	Z	N	A	E_{exp}	E_{th}	ΔE
70	(MeV)	(MeV)	(MeV)						
70			(/				(MeV)	(MeV)	(MeV)
, ,	39.40	37.83	1.57	92	146	238	5.50	5.74	-0.24
76	44.50	44.08	0.42	92	148	240	5.50	6.46	-0.96
90	40.92	41.07	-0.15	94	142	236	4.50	4.57	-0.07
94	44.68	44.39	0.29	94	144	238	5.00	4.71	0.29
98	45.84	47.06	-1.22	94	146	240	5.15	5.05	0.10
198	20.40	21.60	-1.20	94	148	242	5.05	5.82	-0.77
210	21.40	22.16	-0.76	94	150	244	5.00	6.59	-1.59
212	19.50	20.19	-0.69	94	152	246	5.30	7.19	-1.89
228	8.10	7.59	0.51	96	146	242	5.00	4.61	0.39
228	6.50	6.59	-0.09	96	148	244	5.10	5.22	-0.12
230	7.00	5.66	1.34	96	150	246	4.80	6.01	-1.21
232	6.20	5.53	0.67	96	152	248	4.80	6.65	-1.85
234	6.50	5.49	1.01	96	154	250	4.40	6.33	-1.93
232	5.40	4.84	0.56	98	152	250	3.60	6.02	-2.42
234	5.50	5.10	0.40	98	154	252	4.80	5.78	-0.98
236	5.67	5.18	0.49						
	90 94 98 198 210 212 228 228 230 232 234 232 234	90 40.92 94 44.68 98 45.84 198 20.40 210 21.40 212 19.50 228 8.10 228 6.50 230 7.00 232 6.20 234 6.50 232 5.40 234 5.50	90 40.92 41.07 94 44.68 44.39 98 45.84 47.06 198 20.40 21.60 210 21.40 22.16 212 19.50 20.19 228 8.10 7.59 228 6.50 6.59 230 7.00 5.66 232 6.20 5.53 234 6.50 5.49 232 5.40 4.84 234 5.50 5.10	90 40.92 41.07 -0.15 94 44.68 44.39 0.29 98 45.84 47.06 -1.22 198 20.40 21.60 -1.20 210 21.40 22.16 -0.76 212 19.50 20.19 -0.69 228 8.10 7.59 0.51 228 6.50 6.59 -0.09 230 7.00 5.66 1.34 232 6.20 5.53 0.67 234 6.50 5.49 1.01 232 5.40 4.84 0.56 234 5.50 5.10 0.40	90 40.92 41.07 -0.15 94 94 44.68 44.39 0.29 94 98 45.84 47.06 -1.22 94 198 20.40 21.60 -1.20 94 210 21.40 22.16 -0.76 94 212 19.50 20.19 -0.69 94 228 8.10 7.59 0.51 96 230 7.00 5.66 1.34 96 232 6.20 5.53 0.67 96 234 6.50 5.49 1.01 96 232 5.40 4.84 0.56 98 234 5.50 5.10 0.40 98	90 40.92 41.07 -0.15 94 142 94 44.68 44.39 0.29 94 144 98 45.84 47.06 -1.22 94 146 198 20.40 21.60 -1.20 94 148 210 21.40 22.16 -0.76 94 150 212 19.50 20.19 -0.69 94 152 228 8.10 7.59 0.51 96 146 228 6.50 6.59 -0.09 96 148 230 7.00 5.66 1.34 96 150 232 6.20 5.53 0.67 96 152 234 6.50 5.49 1.01 96 154 232 5.40 4.84 0.56 98 152 234 5.50 5.10 0.40 98 154	90 40.92 41.07 -0.15 94 142 236 94 44.68 44.39 0.29 94 144 238 98 45.84 47.06 -1.22 94 146 240 198 20.40 21.60 -1.20 94 148 242 210 21.40 22.16 -0.76 94 150 244 212 19.50 20.19 -0.69 94 152 246 228 8.10 7.59 0.51 96 146 242 228 6.50 6.59 -0.09 96 148 244 230 7.00 5.66 1.34 96 150 246 232 6.20 5.53 0.67 96 152 248 234 6.50 5.49 1.01 96 154 250 232 5.40 4.84 0.56 98 152 250 234 5.50 5.10 0.40 98 154 252 <td>90 40.92 41.07 -0.15 94 142 236 4.50 94 44.68 44.39 0.29 94 144 238 5.00 98 45.84 47.06 -1.22 94 146 240 5.15 198 20.40 21.60 -1.20 94 148 242 5.05 210 21.40 22.16 -0.76 94 150 244 5.00 212 19.50 20.19 -0.69 94 152 246 5.30 228 8.10 7.59 0.51 96 146 242 5.00 228 6.50 6.59 -0.09 96 148 244 5.10 230 7.00 5.66 1.34 96 150 246 4.80 232 6.20 5.53 0.67 96 152 248 4.80 234 6.50 5.49 1.01 96 154 250 4.40 232 5.40 4.84 0.56 98</td> <td>90 40.92 41.07 -0.15 94 142 236 4.50 4.57 94 44.68 44.39 0.29 94 144 238 5.00 4.71 98 45.84 47.06 -1.22 94 146 240 5.15 5.05 198 20.40 21.60 -1.20 94 148 242 5.05 5.82 210 21.40 22.16 -0.76 94 150 244 5.00 6.59 212 19.50 20.19 -0.69 94 152 246 5.30 7.19 228 8.10 7.59 0.51 96 146 242 5.00 4.61 228 6.50 6.59 -0.09 96 148 244 5.10 5.22 230 7.00 5.66 1.34 96 150 246 4.80 6.01 232 6.20 5.53 0.67 96 152 248 4.80 6.65 234 6.50 5.49 1</td>	90 40.92 41.07 -0.15 94 142 236 4.50 94 44.68 44.39 0.29 94 144 238 5.00 98 45.84 47.06 -1.22 94 146 240 5.15 198 20.40 21.60 -1.20 94 148 242 5.05 210 21.40 22.16 -0.76 94 150 244 5.00 212 19.50 20.19 -0.69 94 152 246 5.30 228 8.10 7.59 0.51 96 146 242 5.00 228 6.50 6.59 -0.09 96 148 244 5.10 230 7.00 5.66 1.34 96 150 246 4.80 232 6.20 5.53 0.67 96 152 248 4.80 234 6.50 5.49 1.01 96 154 250 4.40 232 5.40 4.84 0.56 98	90 40.92 41.07 -0.15 94 142 236 4.50 4.57 94 44.68 44.39 0.29 94 144 238 5.00 4.71 98 45.84 47.06 -1.22 94 146 240 5.15 5.05 198 20.40 21.60 -1.20 94 148 242 5.05 5.82 210 21.40 22.16 -0.76 94 150 244 5.00 6.59 212 19.50 20.19 -0.69 94 152 246 5.30 7.19 228 8.10 7.59 0.51 96 146 242 5.00 4.61 228 6.50 6.59 -0.09 96 148 244 5.10 5.22 230 7.00 5.66 1.34 96 150 246 4.80 6.01 232 6.20 5.53 0.67 96 152 248 4.80 6.65 234 6.50 5.49 1

on the macroscopic model used. Please also note that "microscopic corrections" and shell-plus-pairing corrections are different concepts, as elaborated on in the discussion of Fig. 2. In Fig. 4 we plot the experimental microscopic correction in nuclear-chart style. The doubly magic numbers stand out particularly well in the heavy region. In 1936 Bethe and Bacher had the idea that gaps in calculated single-particle level schemes might correspond to large deviations between experimental masses and masses obtained in the semiempirical mass model [86]. At the time there was little mass data available for heavy nuclei so he focused on, nucleon number 20 (40 Ca), but failed to find clear deviations. He concluded that it could be due to inaccurate experimental mass data. But in Fig. 4 we can see that there is no strong effect on masses for Z = 20, N = 20.

When the macroscopic and microscopic parts of the mass calculation are added to obtain the calculated mass excess and this sum is subtracted from the measured masses, the deviations in the bottom part of the figure remain. We have also plotted this deviation in "nuclear-chart style" format in Fig. 5. The trends of the error in the heavy region and with neutron number indicate that this mass model should be quite reliable for nuclei beyond the current end of the periodic system and towards the drip lines, as has also been our experience with the FRDM(1992) [24, 83, 87]. This is further verified by the studies and simulations discussed in Sec. 5.1 on extrapability. Because the FRDM(2012) was finalized on September 6, 2012 and the AME2012 appeared in December 2012 the FRDM(2012) is adjusted to the AME2003 data base [17]. Therefore 219 masses in Fig. 5 situated along the upper and lower borders of the colored region were not included in the adjustment of the model constants. But we see no tendency to increasing deviations in these regions.

In Fig. 6 we study the improvement with respect to experimental data in the FRDM(2012) relative to the FRDM(1992). We compare both models to the AME2003 [17]. In Ref. [9] the FRDM(1992) was compared to the AME1989 data set[18]. We obtained a model error $\sigma_{th} = 0.669$ MeV, but with respect to this new data set the deviation is decreased to $\sigma_{th} = 0.6314$ MeV. The reason is that some measured masses were removed from in the new evaluation, others were revised, and also many of the new masses are in the heavier region where the FRDM(1992) is more accurate. In the new mass calculation the deviations are now smaller, $\sigma_{th} = 0.5595$ MeV, an 11% reduction of the deviations. Particularly we notice that the large fluctuations near the magic neutron number N = 126 are gone. Also at N = 82 the deviations are considerably reduced, in particular when going into the magic shell. These improvements are partly due to the improved calculation of the zero-point energies as discussed in Sect. 2.11.

We also notice that a group of correlated large deviations just beyond N=40 have almost entirely disappeared. The improvements in this region ($N\approx40$) of shape coexistence is due to the more accurate execution of our calculations in the current version, made possible by vastly increased computer power. In the FRDM(1992) calculation, to obtain the potential energy at a specific deformation, we started by calculating a set of single-particle levels at this deformation for a single-particle potential with parameters (that is radius and depth) corresponding to a β -stable nucleus at the nucleon number A under consideration. Then we calculated the shell-plus-pairing corrections for all nuclei with this A value from the proton drip line to the neutron drip line, using this same set of calculated single-particle levels. Then the macroscopic energy was calculated for each individual nuclide with correct parameters and correct Z and A, that is no approximation here. By repeating this procedure for different shapes potential-energy surfaces were obtained. We then located all minima and selected the deepest minimum as the ground-state (with consideration of stability with respect to fission as discussed above). At this minimum we then calculated the single-particle levels with the single-particle potential parameters appropriate for this nucleus to obtain more accurate shell-plus-pairing corrections. We also calculated the effect of ε_3 and ε_6 shape variations at this minimum. However we now find that in cases of

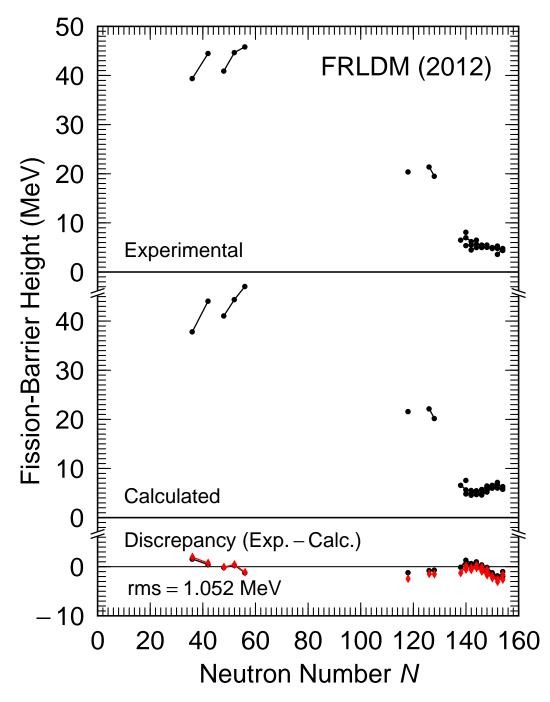


Fig. 12: Comparison of calculated and experimental fission-barrier heights for nuclei throughout the periodic table, after a readjustment of the macroscopic model constants. Experimental barrier heights are well reproduced by the calculations, the rms error is only 1.052 MeV for 31 nuclei. In the actinide region it is the outer of the two peaks in the double-humped barrier that is compared to experimental data. In case of a triple-humped barrier we compare to the higher of the outer two peaks. The (red) diamond symbols indicate the barrier-height differences we obtain when the FRLDM is adjusted only to ground-state masses.

shape coexistence the other minimum in some cases would have been the lower minimum had these additional step been taken also at that minimum. However, at the time we were limited by computer power and the approximations made resulted in significant inaccuracies in only a few cases. The origin of these results is the dependence of the single-particle radii and depths on N-Z, in addition to their A dependence. We find it interesting that our more accurate treatment here gives better agreement with experimental masses. This is a strong indication that we have implemented a realistic isospin dependence for the single-particle potential. We compare in Fig. 7 the FRDM(1992) and FRDM(2012) masses to new experiments [85] in the shape-coexistence region [25, 46] near N=40. In the new calculation the agreement with the measured masses is much improved.

Our nuclear-structure model framework allows us to calculate not just masses, but also other quantities such as β -decay half-lives and β -delayed neutron emission probabilities, and ground-state spins. We are currently in the process of calculating such quantities, which will be submitted for consideration for an ATOMIC DATA AND NUCLEAR DATA TABLES issue with an astrophysical emphasis, in analogy with our previous publication Ref. [24]. But as one example

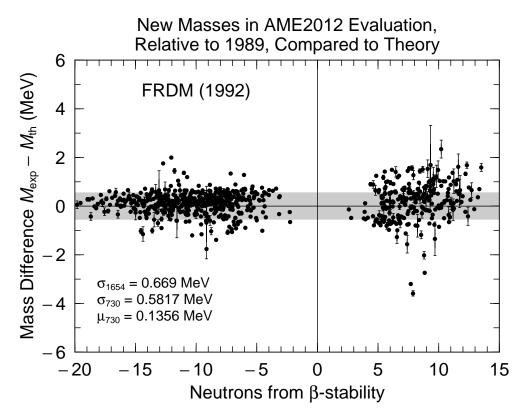


Fig. 13: The previous mass model, the FRDM(1992) compared to masses that are new in AME2012 relative to the data base AME1989. These new masses were not considered in the adjustment of the model constants. There are 730 such new masses. It is gratifying that the deviations are smaller (0.5818 MeV) for these new masses than in the region where the model parameters were adjusted.

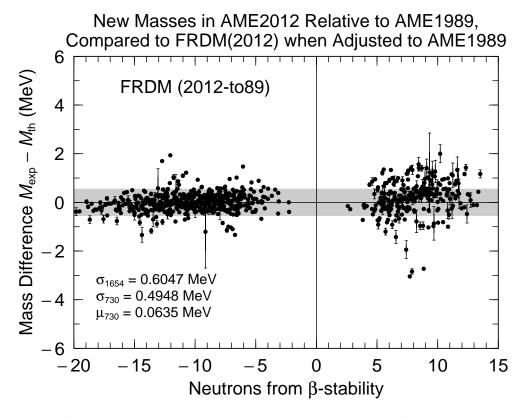


Fig. 14: We have adjusted our current mass model (with all the improvements discussed in the text included) to the older AME1989 experimental evaluation to test the extrapability of the model. It agrees better with the AME1989 data base than FRDM(1992), due to improvements in the calculations, 0.6047 MeV versus 0.669 MeV for the previous FRDM(1992). But it also extrapolates much better 0.4948 MeV for the new nuclei, versus 0.5817 for the previous

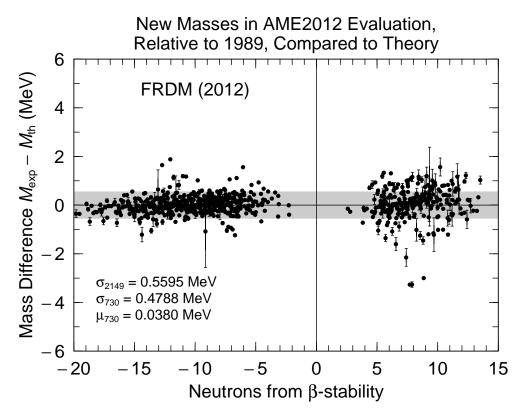


Fig. 15: Masses in FRDM(2012) compared to masses in AME2012 that were not in AME1989. The FRDM(2012) is adjusted to AME2003, so 513 masses shown here were included in this data set. But the accuracy increased only by 0.0160 MeV a 3% change. This indicates that the model extrapolates quite satisfactorily.

of improvements in the FRDM(2012) relative to FRDM(1992), of interest in r-process calculations we show in Fig. 8 results for the one-neutron separation energy S_{1n} . Displayed are contour lines representing the locations of the $S_{1n} = 1,2,3$, and 4 MeV contours for the two models. For FRDM(1992) there is pronounced staggering in some locations, which are essentially absent in the FRDM(2012). These improvements are mainly due to the more accurate ground-state shape deformations and the improved calculations of the ground-state correlation ("zero-point") energies.

The FRLDM(2012), which does not treat Coulomb redistribution effects, is somewhat less accurate than the FRDM(2012), with an 18% larger σ_{th} , as is seen in Fig. 9 and, in nuclear-chart format, in Fig. 10, as well as in Fig. 11. It is particularly in the heavy region that the FRLDM(2012) extends farther away from the zero deviation line, than does the FRDM(2012). There is also a systematic isospin effect on the differences, an effect which is absent in the FRDM(2012), which is especially clear in Fig. 11. This is a sign that the Coulomb redistribution effect is not treated in the FRLDM, which results in too low binding energies for heavy proton-rich nuclides [88]. We will further illustrate this issue in Sect. 5.1.

But, in contrast to the FRDM, we can calculate fission barriers in the FRLDM. We have recently published a calculation of fission barrier heights for 5239 nuclides for all nuclei between the proton and neutron drip lines for the region $171 \le A \le 339$ [61]. This calculation was carried out exactly like here with the minor differences that 1) we have now improved the calculation of the ground-state correlation ("zero-point") energies and readjusted the macroscopic parameter set. That is, the shape space for the ground-state and fission saddle-point determinations are the same in the published barrier study as here. We include axial asymmetry corrections at the ground state in both calculations. We expect a negligible effect on barrier heights if they were calculated in the precise current model version. We have checked this for ${}^{180}_{80}\text{Hg}_{100}$, for which we tabulated in Ref. [89] a barrier height 9.81 MeV, with the current parameter set and the other features here we obtain a barrier height 9.65 MeV. We use the same experimental barrier data set as in Ref. [57] in our adjustment to barrier heights. We show in Table C and in Fig. 12 a comparison of the calculated barriers to the experimental data set.

Conventional wisdom has usually assumed that because the Coulomb and surface-energy terms in the macroscopic energy contribute with the same sign one cannot accurately determine the surface-energy constants from an adjustment to masses alone Rather one would need to also adjust the model parameters to fission-barrier heights because the terms contribute to the barrier heights with different signs. Obviously, if we were dealing with a completely accurate model this would not be necessary. We have tested this conventional wisdom by adjusting the FRLDM macroscopic constants (the usual 6 of them) considering only the AME2003 data set of 2149 masses and excluding fission barriers. In such an adjustment we obtain $\sigma_{th} = 0.6364$ MeV for the FRLDM. It is somewhat remarkable that the agreement with experimental fission-barrier evaluations does not deteriorate greatly; we in this case obtain an rms deviation of 1.475 MeV with respect to the 31 barriers, which probably indicates the robust character of our mass models. We plot these deviations as (red) diamonds in Fig. 12.

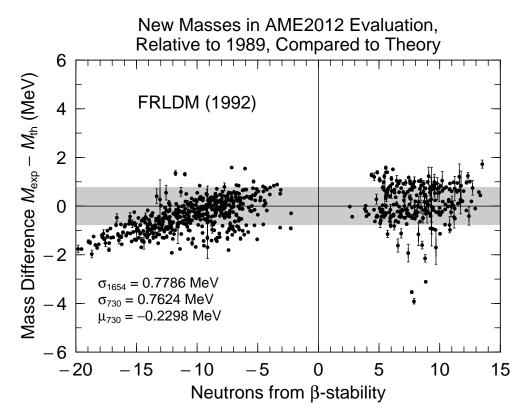


Fig. 16: The FRLDM(1992) compared to masses that are new in AME2012 relative to the data base AME1989. These new masses were not considered in the adjustment of the model constants. There are 730 such new masses. The error has not diverged in this region of new masses, but there is a systematic deviation towards proton drip, which is not present in the FRDM.

5.1. Extrapability

One test of the reliability of a nuclear mass model is to compare differences between measured and calculated masses in new regions of nuclei that were not considered when the constants of the model were determined. It is common to characterize a mass model error (or accuracy) in a certain region of nuclear masses by the rms deviation. However, as we pointed out in Sect. 2.1 this is an unsuitable measure since it is a sum of the model error and the experimental error. Above we discussed a more correct measure, which we introduced in 1988 [3] and normally use ever since. The difference between these two numbers can be substantial, in particular in regions of new nuclei where previously the experimental uncertainties could be sufficiently large to give a noticeable contribution to the rms number. For example, in Ref. [24] we compared (in Table D, first entry) the FRDM(1992) which was adjusted to AME1989 to new measurements in AME1993 that were not included in AME1989; there were 217 such new masses. For the 1654 nuclei in AME1989 to which the FRDM(1992) was adjusted the model error σ_{th} was 0.669 MeV, the rms deviation 0.681 MeV. For the new nuclei we found the model error $\sigma_{th} = 0.642$ MeV but the rms deviation is 0.730 MeV. Thus if the rms measure is used one finds that the "error" diverges in the new region of nuclei because the error is $100 \times 0.730/0.681 - 100$ percent (7.2%) larger in the new region of nuclei. With the more appropriate error measure we find instead that error is 4% smaller in the new region of nuclei.

We are now in a position to compare the FRDM(1992) to a much larger data set of new mass measurements. In the AME2012 evaluation there are 730 masses that were not in the AME1989 data set. In Fig. 13 we show the differences between the new masses and masses tabulated in FRDM(1992). As is our custom we plot the differences as a function of neutrons from stability where for the position of the line of β -stability we use Green's approximation [90]:

$$N - Z = \frac{0.4A^2}{A + 200} \tag{121}$$

We observe that the accuracy of the previous (FRDM(1992)) mass model in this new region of nuclei has improved by $[1 - (0.5817/0.669)] \times 100 = 13.0\%$. The reasons are several. One is that this is not a double-blind test, the experimentalists were aware of our mass model and one can assume that if results strongly deviant from our mass model were obtained the results would be reevaluated (when masses are determined from α and β decay chains it is non-trivial to reach iron-clad conclusions). An illustration of this possibility can be seen in the comparison of Figs. 1 and 2 and the associated discussion in [83]. Another reason might be that in the group of new nuclei most (533) correspond to the region with N > 65 where the model error is lower than for $N \le 65$, where our sample only contains 197 nuclides. The systematic deviation (mean deviation, see Sect. 2.1 for definitions) is 0.1356 MeV indicating that the model masses are underbound by this amount on the average. However, as discussed below we have now found

that in 1992 we had not determined the optimum set of constants, with better optimized constants the mean deviation is much smaller, see Table D.

Our current mass model FRDM(2012) is adjusted to a recent data base, AME2003. We could compare it to the masses that are new in AME2012 relative to AME2003 but we proceed slightly differently for two reasons. First the number of new nuclei would be somewhat limited, and, second, we want to compare how FRDM(2012) performs relative to FRDM(1992). Therefore we have adjusted our current model to AME1989 and obtain FRDM(2012-to89). It means that all the technical improvements and "new physics" outlined in Fig. 1 are included, but we adjust the macroscopic parameters to the earlier experimental data set. Thus we can make a consistent comparison of the two versions, because no feature or quantity of the subsequently new masses have entered into the development of FRDM(2012). We show in Fig. 14 the result of this comparison. First, we notice that we agree better with the AME1989 data base than does the FRDM(1992). Since we now adjust two more parameters to the experimental data base, namely the density-symmetry parameter L (see Refs. [87, 68] and a renormalization constant related to the inertia used in the zero-point energy calculation (see Sect. 2.11), one could have the valid concern that the better accuracy is just a consequence of the two additional variable parameters. However, we note that when this mass table (FRDM(2012-to89)) is compared to the new data set that was not taken into account in the adjustment the accuracy is much better than in the FRDM(1992), 0.4949 MeV compared to 0.5817 MeV, that is a 15% improvement, which at this level of accuracy cannot be achieved with addition of some type of arbitrary new terms. Also, normally if more parameters are introduced to fit a model to known regions, and consequently bind the model more tightly to known data, then it is quite common that this leads to an increase in the divergence of the model outside the region of adjustment. Since the opposite occurs here, and our test data set is substantial, we feel that this is a clear suggestion that the new constants varied represent the addition of realistic new features to the mass model.

In Fig. 15 we compare the current FRDM(2012) to the same data set as in the previous two figures. Most of these nuclei were included in the adjustment, namely 519 out of the total of 730. However, the error only decreased by a small amount, from 0.4948 MeV to 0.4788 MeV, a decrease by 0.0160 MeV, that is by 3.2%.

The three nuclei with differences near -3 MeV are $^{25}_{8}O_{17}$, $^{51}_{19}K_{17}$, and $^{52}_{20}Ca_{32}$, with differences -3.264, -2.996, and -3.264 MeV, respectively. The two latter are in region of seemingly localized deviations that stands out in Fig. 5. The deviations occur in a type of region of localized deviations that occur in the chart below N = 65, so the large deviations here near Z = 20 and N = 30 do not necessarily signal a collapse of the model in the neutron-rich region. For $^{25}_{8}O_{17}$ we observe that this is an extreme strain on our mean-field model with only 4 proton orbitals occupied and more than twice as many neutrons as protons. It is actually surprising to us that we do not obtain larger deviations considering that some (neutron–proton) asymmetry terms are only treated in first order. And, surprisingly perhaps, the

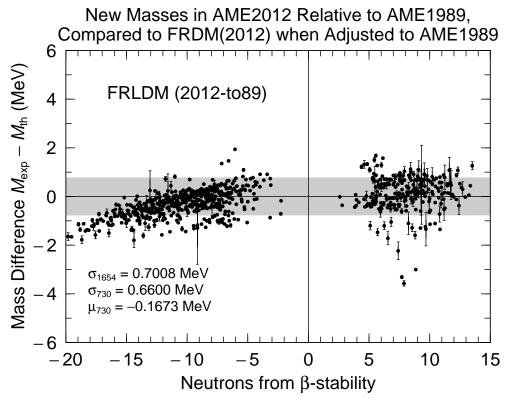


Fig. 17: We have adjusted the current FRLDM(2012) (with all the improvements discussed in the text included) to the older AME1989 experimental evaluation to test the extrapability of the model. It agrees better with the AME1989 data base than FRLDM(1992), due to improvements in the calculations, 0.7008 MeV versus 0.7786 MeV for the previous FRLDM(1992). But it also extrapolates considerably better 0.6600 MeV for the new nuclei, versus 0.7624 MeV for the previous FRDM(1992), although these 730 new nuclei were not taken into account in the adjustment.

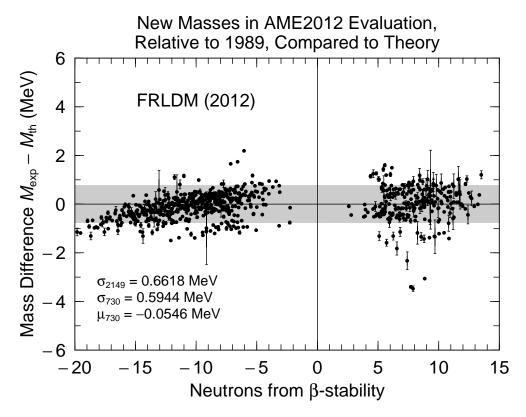


Fig. 18: Masses in FRLDM(2012) compared to masses in AME2012 that were not in AME1989. The FRLDM(2012) is adjusted to AME2003, 513 masses shown here were included in this data set. The inclusion of these masses increased the accuracy from 0.6600 MeV to 0.5944 MeV, a 10% change. This indicates that the model extrapolates somewhat less well than the FRDM to new nuclei.

deviation for the even more neutron-rich nuclide $^{26}_{8}O_{18}$ has *decreased* substantially to only -1.454 MeV. The point with a deviation slightly below -2 MeV is $^{54}_{21}Sc_{33}$ situated in the same region of localized deviations.

We now do similar studies for the FRLDM as in the previous 3 figures for the FRDM. In Fig. 16 we show how the previous FRLDM(1992) predicts the 730 masses that were measured in the time frame 1989–2012. For the FRDM the error (see Fig. 13) is substantially less than in the region of adjustment. Not so for the FRLDM; the error is about the same as in the region of adjustment. The main reason for these deviations is the systematic increase in the deviations towards the proton drip line. We have discussed above and elsewhere (for example in Refs. [88, 91]) that this behavior has its roots in the lack of accounting for Coulomb redistribution effects. For proton-rich heavy nuclei there is a tendency for the charge to deviate from the assumption of a constant charge density and redistribute towards the surface, thus increasing the binding energy slightly. The sign of the deviations in Fig. 16 is consistent with this interpretation. When the new version FRLDM(2012) is adjusted to the same region of experimental masses as the FRLDM(1992) the error decreases to 0.7008 MeV (see Fig. 17), that is a decrease by 10.0% (compared to the 13.0%) decrease for the FRDM). It extrapolates better to the 730 new nuclei; the error is now down from 0.7624 MeV to 0.6600 MeV. This represents a 13.4% decrease in the error when we extrapolate to the new, "unknown" nuclei (versus 15.0% for the FRDM). In Fig. 18 we compare the precise FRLDM(2012) to these 730 nuclei; in this case 519 of them were taken into account in the adjustment of the model constants. The agreement is now better but the systematic deviations towards the proton drip line remain, although to a lesser degree. Now that most nuclei in this region were included in the adjustment the error dropped from 0.6600 MeV to 0.5944 MeV, a 9.9% drop. In the comparable study the FRDM only dropped much less, only by 3.2%. This probably indicates the FRDM is considerably more reliable in applications to regions of nuclei that were not yet available when the model parameters were determined.

5.2. Detailed comparisons of masses and deformations in the FRDM(1992) and FRDM(2012)

In Fig. 19 we show the difference between the masses calculated in the FRDM(1992) and FRDM(2012). In most of the regions of known nuclei there is little difference, normally it is in the range -0.5 MeV to 0.5 MeV. A standard explanation of such results is: "of course, both models are adjusted to this data". But the parameters that are adjusted cannot make the model adapt to the rapid fluctuations in the observed masses that are due to microscopic effects. They are substantial, in the range -12 to +5 MeV or so. Rather the reason for the limited differences is that the previous model was fairly well executed. But the improvements that have been implemented in the FRDM(2012) do sometimes lead to large changes in some localized regions of known nuclei. Furthermore, the changes lead to improved agreement with the calculated masses. For example, near $Z \approx 40$, $N \approx 40$ and $Z \approx 40$, $N \approx 65$ the changes occur because of aspects of our new calculations which impact shape-coexisting nuclei, as discussed above. The differences near N = 76 from about Z = 60 to Z = 70 is due to the consideration of axially asymmetric ground-state shapes, which also impacts

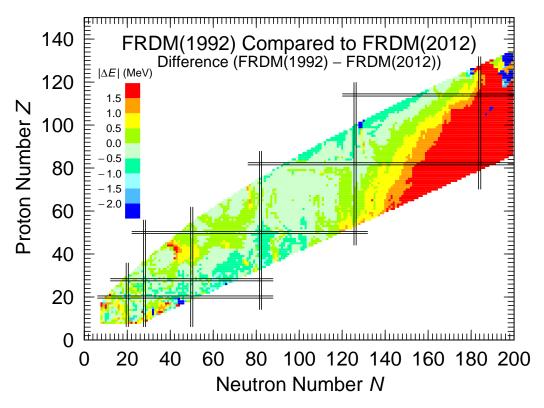


Fig. 19: Difference between masses in the FRDM(1992) and FRDM(2012). The main differences are towards neutron drip in the heavy region, in regions of shape coexistence and of axial asymmetry which are all discussed in more detail in the text.

some neutron-deficient nuclei just below Z = 82, for example the ground state of ¹⁹²Pt is lowered by 0.30 MeV by axial asymmetry [45].

The large differences in masses near the proton drip line in the heavy-element region are due to a more exact implementation of the rule to select as the ground state the minimum with the highest fission barrier that we now have,

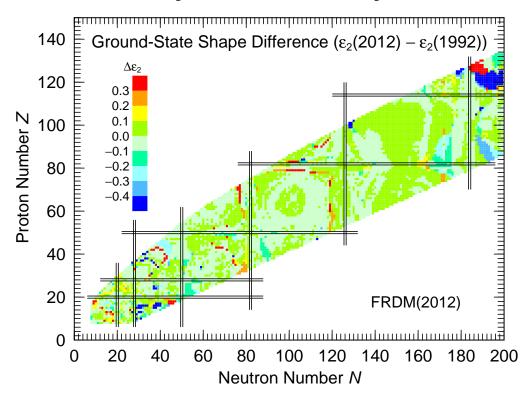


Fig. 20: Difference between the value of the ground-state shape parameter ε_2 obtained in the current model and the value obtained in FRDM(1992). The differences are largest in areas of shape coexistence, axial asymmetry, and going into magic numbers.

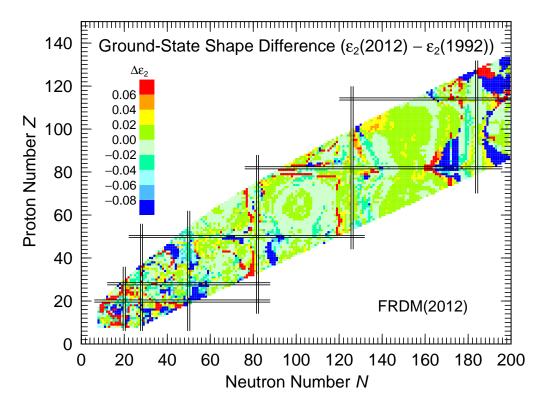


Fig. 21: A more detailed look at difference between the value of the ground-state shape parameter ε_2 obtained in the current model and the value obtained in FRDM(1992). In the well-deformed rare-earth and actinide regions there is little difference.

due to our calculation of potential-energy surfaces in the axial-asymmetry shape space. Often when we see the large differences, such as those near 228 Fm, in the region Z > 114, N > 184, and near $^{298}_{108}$ Hs₁₉₀ the fission barriers are very low, about one MeV only [61]. Therefore the seemingly pathological results with very sudden, discontinuous jumps in the model differences are not due to any mistake, they are an artifact of very low fission barriers and multiple minima in the calculated potential-energy surface. In the specific case of $^{298}_{108}$ Hs₁₉₀ we find in the FRDM(2012) a ground-state deformation $\varepsilon_2 = -0.64$ and mass excess 216.029 MeV, whereas in the FRDM(1992) the values tabulated are $\varepsilon_2 = 0.0$

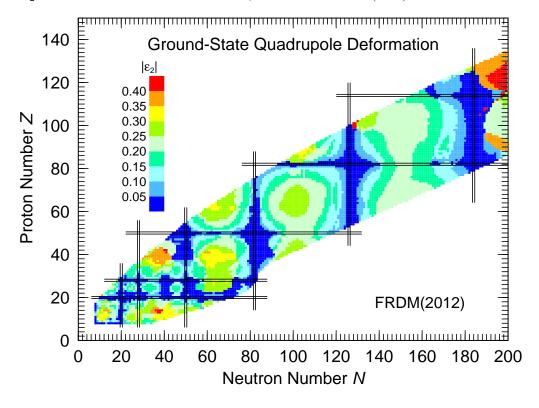


Fig. 22: Calculated values of $|\varepsilon_2|$ for nuclei with N < 200

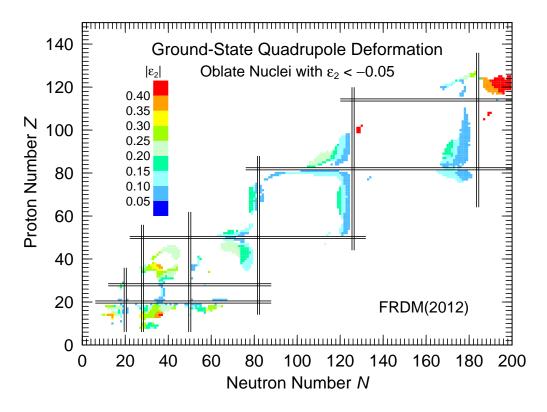


Fig. 23: Calculated values of $|\varepsilon_2|$ for nuclei with oblate ground-state shapes

and mass excess 212.97 MeV. As explained above, we did also consider fission stability in the previous calculations although it was unfortunately not stated in the paper. But, because we could not calculate the potential-energy surface in the axial-asymmetry plane we always assumed that minima on the oblate axis that were higher in energy than prolate minima would always be unstable in the γ plane.

In the case of astrophysical applications, for example to the r-process, one may need to investigate if some other rule should be used in selecting the "ground state". For example in calculations of neutron-capture rates it would perhaps be more correct to select minima in the two nuclei involved in the capture process that have similar deformations. The same holds true in β -decay processes.

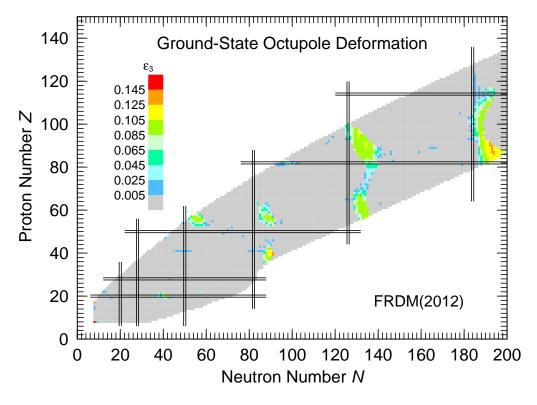


Fig. 24: Calculated values of ε_3 .

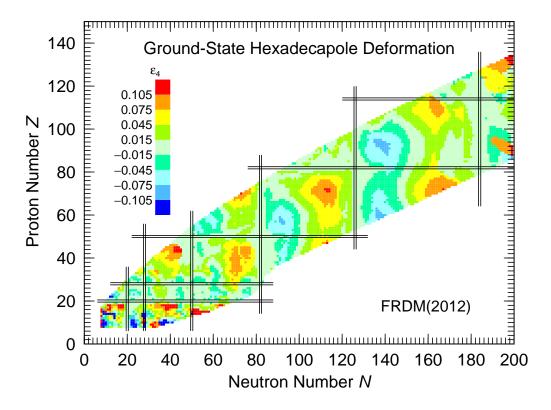


Fig. 25: Calculated values of ε_4 .

The systematic increase in the mass differences towards the neutron drip line in the heavy region is very gradual and may be untestable. For example for our most neutron-rich Pb nuclide we found in FRDM(1992) a mass excess 360.04 MeV, in the FRDM(2012) we obtain the mass excess 353.629 MeV. However, in the FRDM(1992) we have $S_{1n} = -1.58$ MeV and $Q_{\beta} = 19.12$ MeV. In the FRDM(2012) we find $S_{1n} = -1.41$ MeV and $Q_{\beta} = 18.88$ MeV. Thus, the differences are smaller than the accuracy stated in Ref. [24] for S_{1n} (0.526 MeV) and $Q_{\beta} = (0.647$ MeV), so the effect on r-process calculations may be much less severe than the fairly large differences in the mass excesses seem to indicate

Also of interest are the differences in ground-state deformations. We show in Fig. 20 the difference between the

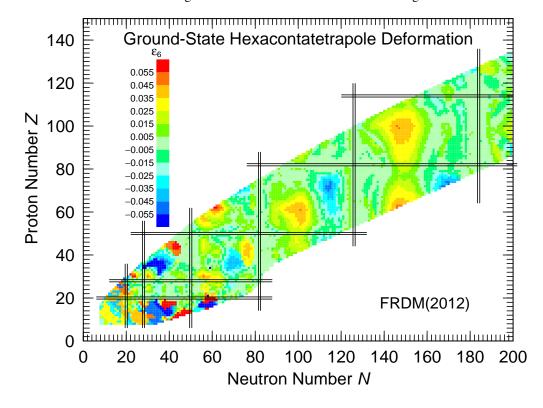


Fig. 26: Calculated values of ε_6 .

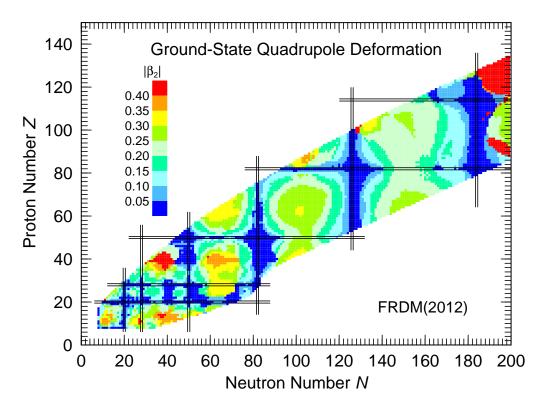


Fig. 27: Values of the shape parameter $|\beta_2|$ corresponding to calculated ground-state shapes, obtained by using the relation in Eq. (38).

quadrupole deformation ε_2 obtained in the FRDM(2012) and FRDM(1992). The same quantity is plotted in a more detailed scale in Fig. 21. Above N=160 there are a substantial number of differences. They occur because there are multiple minima in the calculated potential-energy surfaces. Because we now study the energy with inclusion of axial asymmetry we can more correctly determine which of these minima has the highest barrier with respect to fission. So in many cases we now select a different minimum than was chosen in FRDM(1992) as the most stable

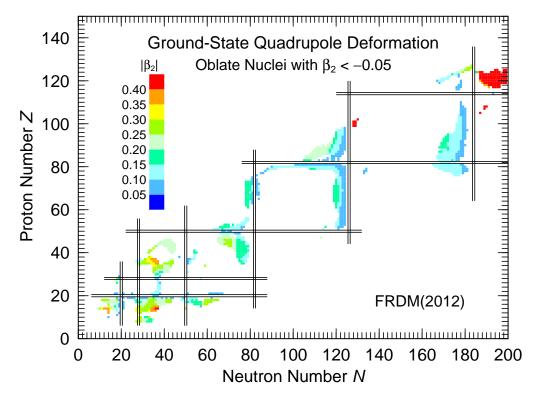


Fig. 28: Values of the shape parameter $|\beta_2|$ corresponding to calculated ground-state shapes, for nuclei with oblate ground-state shapes, obtained by using the relation in Eq. (38).

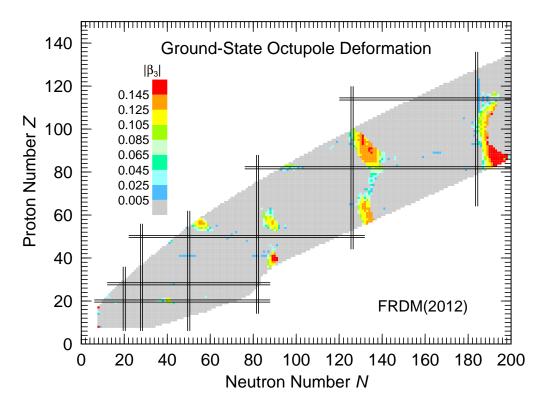


Fig. 29: Values of the shape parameter β_3 corresponding to calculated ground-state shapes, obtained by using the relation in Eq. (38).

minimum. For lighter nuclides most differences occur in the regions of shape coexistence and axial asymmetry. In the transition regions between deformed and spherical nuclei the calculated potential-energy surfaces are very flat and small effects can change the locations of the very shallow minima on such surfaces, therefore we also have differences in those regions. Also in the more detailed scale in Fig. 21 we see little difference between the two calculations in the traditional deformed rare-earth and actinide regions.

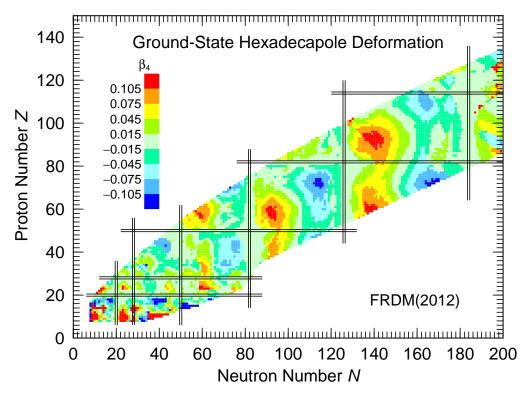


Fig. 30: Values of the shape parameter β_4 corresponding to calculated ground-state shapes, obtained by using the relation in Eq. (38).

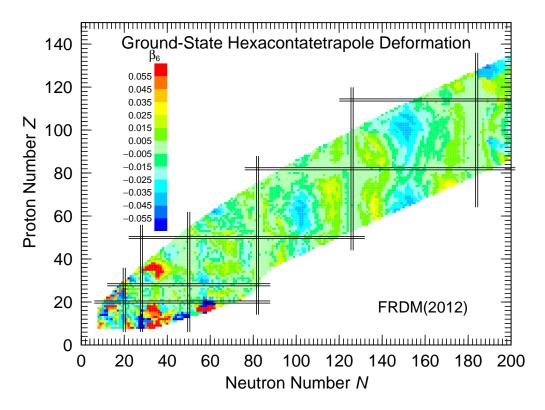


Fig. 31: Values of the shape parameter β_6 corresponding to calculated ground-state shapes, obtained by using the relation in Eq. (38).

5.3. Calculated ground-state masses and deformations

We tabulate the new FRDM(2012) and FRLDM(2012) "mass tables" in the Table. As before we also tabulate the calculated shape parameters, both the calculated ε shape parameters and their corresponding β parameters, as well as the microscopic corrections. As explained above the microscopic corrections are different from the shell-plus-

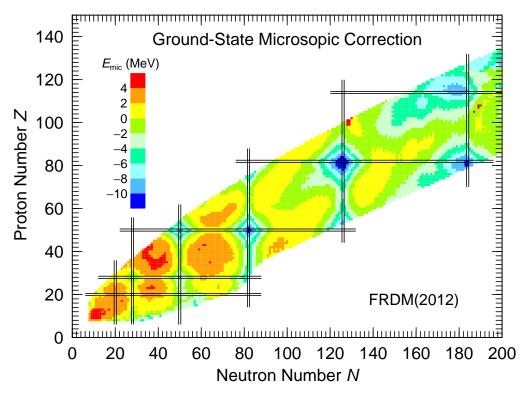


Fig. 32: Calculated ground-state microscopic corrections. The effect at magic numbers generally increases towards heavier nuclei. Large gaps in calculated level spectra at deformed ground-state shapes give enhanced stability, as is by now well-established experimentally, away from doubly magic nucleon numbers near $^{270}_{108}\text{Hs}_{162}$. This effect could already be seen 40 years ago in our early work [37]. More global studies appeared a little later in Refs. [2, 72].

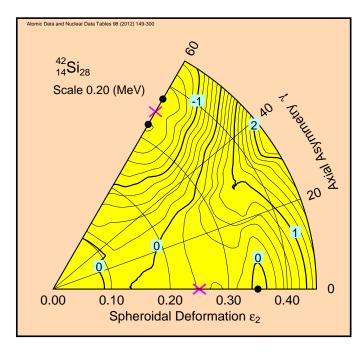


Fig. 33: Calculated potential-energy surface for ${}_{14}^{42}$ Si₂₈. Although the neutron number is magic, N = 28, the calculated ground-state shape is quite deformed (oblate). See further discussion in the text.

pairing corrections and do depend on the macroscopic model used, therefore there are two "microscopic-correction" numbers for each nuclide, one corresponding to the FRDM(2012) and one to the FRLDM(2012). We also include the experimental masses that we used in our adjustment of the model parameters and the quoted errors, from Ref. [17]. We have added one new data set relative to what was tabulated for the FRDM(1992) in Ref. [9], namely the ground-state shell-plus-pairing corrections. These depend only on the single-particle level spectrum and are thus identical in the FRDM and FRLDM, so there is only one column of these data. Finally, we give ground-state masses in the FRDM expressed as total binding energies. It is a new column, but not a new data set because the total binding energy can be obtained from the mass excess through the relation

$$E_{\text{bind}} = ZM_{\text{H}} + NM_{\text{n}} - M(Z, N), \tag{122}$$

where $M_{\rm H}$ is the hydrogen-atom mass excess and $M_{\rm n}$ is the neutron mass excess. This total binding energy is physically the sum of the masses of Z hydrogen atoms and N neutrons at infinity minus the mass of the "assembled" atom. In the present context, total binding energy is used to mean the nuclear binding energy plus the difference between the binding energy of the Z electrons comprising the atom, which we approximate by $a_{\rm el}Z^{2.39}$, with $a_{\rm el}=1.433\times 10^{-5}$ MeV, and the binding energy of Z hydrogen atoms. For consistency, the values $M_{\rm H}=7.289034$ MeV and $M_{\rm n}=8.071431$ MeV should be used here for these quantities [9], although more recent evaluations give slightly different results. An alternative possibility would have been to define total binding energy as the difference between the sum of the masses of all constituent particles (consisting of Z protons, Z electrons, and N neutrons) at infinity minus the mass of the atom. This alternative definition of total binding energy differs from the one that has been used historically and that we have adopted here by the binding energy of Z hydrogen atoms, which is numerically equal to Z times 13.6056981 eV.

We show in graphical nuclear-chart style in Fig. 22 the calculated values of $|\varepsilon_2|$, in Fig. 23 the calculated values of $|\varepsilon_2|$ for those nuclei with $|\varepsilon_2| < -0.05$, in Fig. 24 the calculated values of $|\varepsilon_3|$, in Fig. 25 the calculated values of $|\varepsilon_4|$, and in Fig. 26 the calculated values of $|\varepsilon_4|$, and in Fig. 26 the calculated values of $|\varepsilon_4|$, and 31. The results for the spheroidal deformation $|\varepsilon_2|$ in Fig. 22 show the by now well known regular behavior. The deformation increases by about 0.05 with each deformed region as we go toward lighter nuclei. Oblate deformations occur mainly in transition regions from deformed nuclei to magic numbers, on the heavy side of the deformed regions. The microscopic reason for the large prevalence of prolate nuclei has been discussed in Ref. [92]. Lighter nuclei show a more irregular behavior, possibly because a single nucleon orbital here has a (much) larger fractional effect on the system.

Nuclei that are calculated to be octupole deformed in the ground state are relatively rare as is shown in Fig. 24. The most well known region is around ²²²Ra. In our model, consideration of octupole shapes leads to significantly improved ground-state masses. The octupole effects were noticed in our first global nuclear mass calculation the FRLDM(1981) [1] and were studied in greater detail subsequently, see for example [27, 28, 29, 9, 45]. Axial asymmetry effects also affect a few nuclides, an in-depth discussion of these results is in Refs. [44, 45].

The hexadecapole deformation ε_4 behaves in a very regular fashion throughout most of the chart, except the very lightest region, see Fig. 25. It is minimum, near -0.10, in the beginning of deformed regions and +0.10 at the end of the deformed regions. Since the first experimental studies became available calculations have reproduced well this systematic behavior [93, 77, 94].

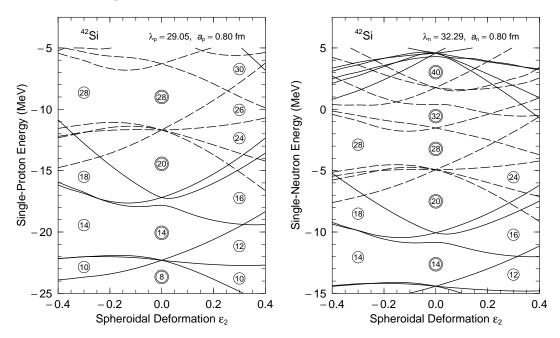


Fig. 34: Calculated proton and neutron single-particle levels for ⁴²₁₄Si₂₈.

5.3.1. Do magic numbers really disappear for some exotic nuclei?

Both in the light and heavy region there are nuclei with either the proton or neutron number "magic" but which are anyway calculated to be deformed. We give one example of this type of result, for ${}^{42}_{14}\mathrm{Si}_{28}$ in Fig. 33. We find for this nucleus that the calculated ground-state deformation is $\varepsilon_2 = -0.31$, $\varepsilon_3 = 0.00$, $\varepsilon_4 = -0.12$, and $\varepsilon_6 = -0.05$. When it is experimentally found that a nuclide with either a magic neutron number or a magic proton number is found to be deformed this is sometimes presented as a mystical new phenomenon for "exotic" nuclei, and taken as evidence that a long accepted magic number has "disappeared". But this is not necessarily the case. First let us recall what conventional magic numbers are. They are specific numbers that correspond to large gaps in calculated spherical level spectra for neutrons and protons. Large gaps are associated with increased stability at these specific numbers, which is also observed experimentally. We show in Fig. 34 calculated proton and neutron single-particle levels versus deformation for ${}^{42}_{14}\mathrm{Si}_{28}$. This figure shows that the conventional magic numbers 8, 20, and 28 still exist for spherical shape. However, in our example the gaps at Z=14 and N=28 are somewhat larger near the oblate shape $\varepsilon_2=-0.3$ than at spherical shape so this leads to an oblate shape being the most stable configuration for this nuclide, although the normal spherical level gap at neutron number N=28 has not "disappeared".

5.3.2. Dependence of model accuracy with nucleon number A

Figure 3 shows that the error increases with decreasing nucleon number A in a somewhat systematic fashion. To show this more clearly we have determined the model error for limited regions of nuclei by use of Eq. (9). We select A=25(25)250 as centerpoints of the regions and define each region to extend from $A_{\rm center}-24$ to $A_{\rm center}+25$. the errors in these restricted regions are shown as black dots in Fig. 35. The analogous deviations in FRDM(1992) are plotted as black circles with a red interior. The FRDM(2012) errors are always smaller than the FRDM(1992) errors, vary almost completely linearly from A=25 to A=125 and are almost constant from A=125 to A=250. There are 1628 known masses in this region (from A=101 to A=270); for these nuclei together we find $\sigma_{\rm th}=0.362$ MeV. For the limited regions in this range we find that the smallest error is $\sigma_{\rm th}=0.335$ MeV for $A_{\rm center}=150$ and the largest error is $\sigma_{\rm th}=0.378$ MeV for $A_{\rm center}=200$.

6. SOME ADDITIONAL STUDIES AND DISCUSSION

It is natural to ask how sensitive our results, (for example extrapability and parameter values) are to various model assumptions we have made (such as setting the compressibility K to 240 MeV and to the data sets used) in the determination of model parameters. We performed some studies on how well the model performs in new regions of masses that were not used in the adjustment of model parameters in Sect. 5.1. We present the results of the studies of how well the model applies to new regions of nuclei and some sensitivity studies in Table D. First we review the steps that led to FRDM(2012); some of the first steps were discussed in Refs. [83] and [87]. So that we can refer to specific locations in the table, we give a line number in column 1. In column 2 a model designation is given; most of these "models" were just stages on the path to the current FRDM(2012). Differences between "models" can be of different types, namely new or different physics, different subset of constants varied, or the region of masses used in the adjustment of model parameters. Once a "model" has been developed we can, without changing the model, compare the mass table generated to different mass regions. In such comparisons no values of the constants are given in the table, they are in this case the same as the constant values given immediately above. In column 3 the first number

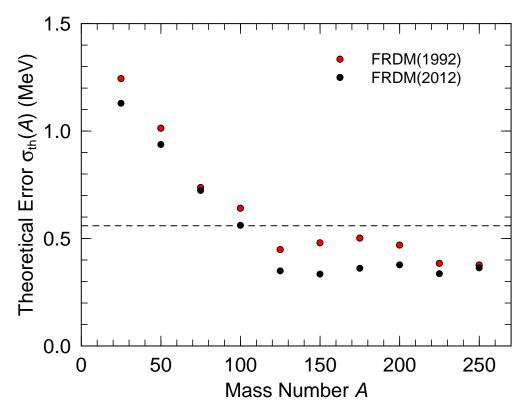


Fig. 35: Error in the mass FRDM(1992) and FRDM(2012) calculations as functions of A. The error is consistently smaller in the FRDM(2012) calculation than in the FRDM(1992) calculation for all regions of A.

("A") refers to the data set to which the model was adjusted. The second number refers to the data set to which the model was compared to, that is what data set was used to calculate the model mean deviation μ_{th} and model error $\sigma_{th;\mu=0}$. There are three mass evaluations and various sets of "new" masses that we use in our adjustments and tests. The numbers and corresponding evaluated mass data bases are

1. This data set is the AME1989 mass evaluation [18]. The FRDM(1992) was adjusted to this data set.

1654 nuclei

2. This data set is the AME2003 mass evaluation [18]. The FRDM(2012) is adjusted to this data set.

2149 nuclei

3. This data set are masses that are in the interim AME2011 evaluation [95] but are not in the AME2003 evaluation. In some previous investigations we used this data set to represent "new" masses that were not used in the determination of model parameters (since the most recent AME2012 [81] evaluation was not available at that time)

154 nuclei

4. This data set is the AME2012 mass in the evaluation [81].

2352 nuclei

5. This data set is the masses that are in the AME2012 evaluation that are not in the AME2003 evaluation.

219 nuclei

6. This data set is the masses in the AME2012 evaluation that are not in the AME1989 evaluation.

730 nuclei

The number of nuclei we indicate are only those with $Z \ge 8$ and $N \ge 8$; we do not consider lighter nuclei in our calculations. When we perform an adjustment to find optimum constants we always show the error for the same region of nuclei used in the adjustment. Therefore, when a line contains a set of constant values the "A" and "C" regions are always the same.

In line 1 of the table we show the previous FRDM(1992) mass model. Its agreement with the 730 new masses in AME2012 is shown on the second line. We later found that we could optimize the parameters better, and this solution yields $\sigma_{th} = 0.6614$ MeV [83]. We also removed consideration of fission barriers and then arrive at model (92)-b. The mass σ_{th} only decreases by a small amount, to 0.6591 MeV. This represents step 1 in Fig. 1. On line 4 we show how this better optimized model agrees with masses that are new in AME2012. It is remarkable that when we more tightly bind the original model to the AME1989 it reproduces new masses better, in particular the mean ("systematic") error μ_{th} is now much closer to zero. When a model with adjustable parameters is more tightly bound to known data one often finds that its performance outside this region has become poorer, but this is not the case here. On line 5 we compare the FRDM(1992) now in its incarnation (92)-b (with its better optimized parameters and no barriers included in the fit) to (the entire) AME2003, and find the error is now about 0.04 MeV smaller. So the model agrees better with

FRDM(1992)	Line No	Model	A/C	a ₁ (MeV)	a ₂ (MeV)	J (MeV)	Q (MeV)	K (MeV)	L (MeV)	a ₀ (MeV)	c _a (MeV)	C (MeV)	γ	μ_{th} (MeV)	$\sigma_{\text{th};\mu=0}$ (MeV)
3	1	FRDM(1992)	1/1	16.247	22.92	32.73	29.21	240	0	0.00	0.436	60	0.831	0.0156	0.6688
Column C	2	FRDM(1992)	1/6											0.1356	0.5817
5 (92)-b 1/2 0.0076 0.6157 6 (06)-a 2/2 16.274 23.27 32.19 30.64 240 0 -5.00 0.450 169 1.000 0.0000 0.6140 7 (07)-b 2/2 16.231 22.96 32.11 30.83 240 0 -3.33 0.460 119 0.907 0.0000 0.5964 8 (11)-b 2/2 16.231 22.95 32.10 30.78 240 0 -3.14 0.456 113 0.896 0.0001 0.5863 9 (11)-b 2/3 2 16.147 22.44 32.51 28.54 240 70.84 -2.96 0.531 150 0.880 -0.0004 0.5700 11 (11)-a 2/3 32.10 32.31 30.49 240 0 -3.43 0.471 123 0.935 -0.0003 0.6300 12 (11)-c 1/1 16.142 22.39 32.98 <td>3</td> <td>(92)-b</td> <td>1/1</td> <td>16.286</td> <td>23.37</td> <td>32.34</td> <td>30.51</td> <td>240</td> <td>0</td> <td>-5.21</td> <td>0.468</td> <td>179</td> <td>1.027</td> <td>0.0000</td> <td>0.6591</td>	3	(92)-b	1/1	16.286	23.37	32.34	30.51	240	0	-5.21	0.468	179	1.027	0.0000	0.6591
6	4	(92)-b	1/6											-0.0243	0.5506
7 (07)-b 2/2 16.231 22.96 32.11 30.83 240 0 −3.33 0.460 119 0.907 0.0000 0.5964 8 (11)-b 2/2 16.231 22.95 32.10 30.78 240 0 −3.14 0.456 113 0.896 0.0001 0.5863 9 (11)-b 2/2 16.147 22.44 32.51 28.54 240 70.84 −2.96 0.531 150 0.880 −0.00516 0.5618 11 (11)-a 2/3 32.31 30.49 240 0 −3.43 0.471 123 0.935 −0.0031 0.5618 12 (11)-d 1/1 16.142 22.39 32.98 27.58 240 85.95 −2.64 0.548 138 0.853 0.0000 0.6020 14 FRDM(2012) 2/2 16.195 22.76 32.30 28.72 240 53.50 -4.00 0.489 205 0.988	5	(92)-b	1/2											0.0076	0.6157
8 (11)-b 2/2 16.231 22.95 32.10 30.78 240 0 -3.14 0.456 113 0.896 0.0001 0.5863 9 (11)-b 2/3 5 28.51 28.54 240 70.84 -2.96 0.531 150 0.880 -0.0004 0.5700 11 (11)-a 2/3 3 3 240 70.84 -2.96 0.531 150 0.880 -0.0004 0.5618 12 (11)-a 1/1 16.251 23.10 32.31 30.49 240 0 -3.43 0.471 123 0.935 -0.0003 0.6300 13 (11)-d 1/1 16.142 22.39 32.98 27.58 240 85.95 -2.64 0.548 138 0.853 0.0000 0.692 14 FRDM(2012) 2/2 16.6195 22.76 32.30 28.72 240 57.77 -3.74 0.513 205 0.988 -0.0007 <	6	(06)-a	2/2	16.274	23.27	32.19	30.64	240	0	-5.00	0.450	169	1.000	0.0000	0.6140
9	7	(07)-b	2/2	16.231	22.96	32.11	30.83	240	0	-3.33	0.460	119	0.907	0.0000	0.5964
10	8	(11)-b	2/2	16.231	22.95	32.10	30.78	240	0	-3.14	0.456	113	0.896	0.0001	0.5863
11	9	(11)-b	2/3											-0.0850	0.6212
12	10	(11)-a	2/2	16.147	22.44	32.51	28.54	240	70.84	-2.96	0.531	150	0.880	-0.0004	0.5700
13	11	(11)-a	2/3											-0.0516	0.5618
FRDM(2012) 2/2 16.195 22.76 32.30 28.72 240 53.50 -4.00 0.489 205 0.988 -0.0007 0.5595 0.0642 0.6440 0.0094 0.5728 17 (12)-b 4/4 16.175 22.64 32.40 28.51 240 67.77 -3.74 0.513 206 0.974 0.0000 0.5711 18 (12)-c 1/4 16.211 22.87 32.70 27.95 240 59.77 -4.25 0.509 205 0.996 0.0000 0.6047 0.0635 0.4948 20 (12)-c 1/6 0.0635 0.4948 21 (12)-d 4/4 16.268 23.23 32.13 30.53 240 0 -4.89 0.439 179 1.007 0.0000 0.5905 22 (12)-e 1/4 16.288 23.39 32.34 30.39 240 0 -5.56 0.465 218 1.065 -0.0002 0.6147 0.0161 0.5949 24 (12)-e 1/6 0.0161 0.5949 24 (12)-e 1/6 0.0161 0.5949 25 (12-Kfix-1) 2/2 16.319 23.93 32.45 28.41 100 23.54 -8.45 0.384 127 0.823 0.0000 0.6025 26 (12-Kfix-3) 2/2 16.212 22.92 32.31 28.64 200 46.11 -4.65 0.474 180 0.944 0.0000 0.5619 28 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6099 32.54 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6099 32.59 32.49 3	12	(11)-c	1/1	16.251	23.10	32.31	30.49	240	0	-3.43	0.471	123	0.935	-0.0003	0.6300
This	13	(11)-d	1/1	16.142	22.39	32.98	27.58	240	85.95	-2.64	0.548	138	0.853	0.0000	0.6092
The Frd Transfer	14	FRDM(2012)	2/2	16.195	22.76	32.30	28.72	240	53.50	-4.00	0.489	205	0.988	-0.0007	0.5595
17	15	FRDM(2012)	2/5											0.0642	0.6440
18 (12)-c 1/1 16.211 22.87 32.70 27.95 240 59.77 -4.25 0.509 205 0.996 0.0000 0.6047 19 (12)-c 1/4	16	FRDM(2012)	2/4											0.0094	0.5728
19	17	(12)-b	4/4	16.175	22.64	32.40	28.51	240	67.77	-3.74	0.513	206	0.974	0.0000	0.5711
20 (12)-c 1/6 0.0635 0.4948 21 (12)-d 4/4 16.268 23.23 32.13 30.53 240 0 -4.89 0.439 179 1.007 0.0000 0.5905 22 (12)-e 1/1 16.288 23.39 32.34 30.39 240 0 -5.56 0.465 218 1.065 -0.0002 0.6147 23 (12)-e 1/4	18	(12)-c	1/1	16.211	22.87	32.70	27.95	240	59.77	-4.25	0.509	205	0.996	0.0000	0.6047
21 (12)-d 4/4 16.268 23.23 32.13 30.53 240 0 -4.89 0.439 179 1.007 0.0000 0.5905 22 (12)-e 1/1 16.288 23.39 32.34 30.39 240 0 -5.56 0.465 218 1.065 -0.0002 0.6147 23 (12)-e 1/4	19	(12)-c	1/4											0.0307	0.5764
22 (12)-e 1/1 16.288 23.39 32.34 30.39 240 0 -5.56 0.465 218 1.065 -0.0002 0.6147 23 (12)-e 1/4	20	(12)-c	1/6											0.0635	0.4948
23 (12)-e 1/4	21	(12)-d	4/4	16.268	23.23	32.13	30.53	240	0	-4.89	0.439	179	1.007	0.0000	0.5905
24 (12)-e 1/6 —0.0197 0.5306 25 (12-Kfix-1) 2/2 16.319 23.93 32.45 28.41 100 23.54 -8.45 0.384 127 0.823 0.0000 0.6025 26 (12-Kfix-2) 2/2 16.242 23.22 32.32 28.55 150 35.47 -5.82 0.444 151 0.886 0.0000 0.5694 27 (12-Kfix-3) 2/2 16.212 22.92 32.31 28.64 200 46.11 -4.65 0.474 180 0.944 0.0000 0.5612 28 (12-Kvar) 2/2 16.193 22.74 32.31 28.73 256 56.16 -3.91 0.494 217 1.007 0.0000 0.5593 29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16	22	(12)-e	1/1	16.288	23.39	32.34	30.39	240	0	-5.56	0.465	218	1.065	-0.0002	0.6147
25 (12-Kfix-1) 2/2 16.319 23.93 32.45 28.41 100 23.54 -8.45 0.384 127 0.823 0.0000 0.6025 26 (12-Kfix-2) 2/2 16.242 23.22 32.32 28.55 150 35.47 -5.82 0.444 151 0.886 0.0000 0.5694 27 (12-Kfix-3) 2/2 16.212 22.92 32.31 28.64 200 46.11 -4.65 0.474 180 0.944 0.0000 0.5612 28 (12-Kvar) 2/2 16.193 22.74 32.31 28.73 256 56.16 -3.91 0.494 217 1.007 0.0000 0.5593 29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5750 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	23	(12)-e	1/4											0.0161	0.5949
26 (12-Kfix-2) 2/2 16.242 23.22 32.32 28.55 150 35.47 -5.82 0.444 151 0.886 0.0000 0.5694 27 (12-Kfix-3) 2/2 16.212 22.92 32.31 28.64 200 46.11 -4.65 0.474 180 0.944 0.0000 0.5612 28 (12-Kvar) 2/2 16.193 22.74 32.31 28.73 256 56.16 -3.91 0.494 217 1.007 0.0000 0.5593 29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5750 32	24	(12)-e	1/6											-0.0197	0.5306
27 (12-Kfix-3) 2/2 16.212 22.92 32.31 28.64 200 46.11 -4.65 0.474 180 0.944 0.0000 0.5612 28 (12-Kvar) 2/2 16.193 22.74 32.31 28.73 256 56.16 -3.91 0.494 217 1.007 0.0000 0.5593 29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5715 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33	25	(12-Kfix-1)	2/2	16.319	23.93	32.45	28.41	100	23.54	-8.45	0.384	127	0.823	0.0000	0.6025
28 (12-Kvar) 2/2 16.193 22.74 32.31 28.73 256 56.16 -3.91 0.494 217 1.007 0.0000 0.5593 29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5715 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	26	(12-Kfix-2)	2/2	16.242	23.22	32.32	28.55	150	35.47	-5.82	0.444	151	0.886	0.0000	0.5694
29 (12-Kfix-4) 2/2 16.165 22.47 32.33 28.96 400 76.96 -2.84 0.521 334 1.147 0.0000 0.5619 30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5715 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	27	(12-Kfix-3)	2/2	16.212	22.92	32.31	28.64	200	46.11	-4.65	0.474	180	0.944	0.0000	0.5612
30 (12-Kfix-5) 2/2 16.141 22.26 32.36 29.21 600 101.28 -1.98 0.541 515 1.286 0.0001 0.5671 31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5715 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	28	(12-Kvar)	2/2	16.193	22.74	32.31	28.73	256	56.16	-3.91	0.494	217	1.007	0.0000	0.5593
31 (12-Kfix-6) 2/2 16.123 22.12 32.38 29.42 800 124.79 -1.39 0.554 623 1.350 0.0000 0.5715 32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	29	(12-Kfix-4)	2/2	16.165	22.47	32.33	28.96	400	76.96	-2.84	0.521	334	1.147	0.0000	0.5619
32 (12-Kfix-7) 2/2 16.114 22.04 32.39 29.58 1000 143.45 -1.09 0.561 825 1.439 0.0000 0.5750 33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	30	(12-Kfix-5)	2/2	16.141	22.26	32.36	29.21	600	101.28	-1.98	0.541	515	1.286	0.0001	0.5671
33 (FY1970) 2/2 15.949 21.10 31.37 32.49 240 0 1.76 0.543 78 0.589 -0.0001 0.6909	31	(12-Kfix-6)	2/2	16.123	22.12	32.38	29.42	800	124.79	-1.39	0.554	623	1.350	0.0000	0.5715
	32	(12-Kfix-7)	2/2	16.114	22.04	32.39	29.58	1000	143.45	-1.09	0.561	825	1.439	0.0000	0.5750
34 (FY1970)-L 2/2 15.935 21.01 31.37 31.96 240 39.03 2.30 0.543 106 0.668 -0.0003 0.6876	33	(FY1970)	2/2	15.949	21.10	31.37	32.49	240	0	1.76	0.543	78	0.589	-0.0001	0.6909
	_34	(FY1970)-L	2/2	15.935	21.01	31.37	31.96	240	39.03	2.30	0.543	106	0.668	-0.0003	0.6876

Table D

FRDM (1992) and successive enhancements. Adjustments have been performed for up to 9 macroscopic constants, i.e, the volume-energy (a_1) , the surface-energy (a_2) , the symmetry-energy (J), the effective surface-stiffness (Q), the density-symmetry (L), the A^0 (a_0) , the charge-asymmetry (c_a) , the pre-exponential compressibility-term constant (C) and the exponential compressibility-term range (γ) constants. In one case the compressibility constant (K) is also varied, in a few other "sensitivity" studies it is fixed at values different from 240 MeV. These results are in lines 25–32. The second column indicates a model designation and the third is to which data set (denoted by numbers "1" through "6") the model was Adjusted/Compared "(A/C)". The last two columns are the mean deviation (with sign) μ_{th} and the model error $\sigma_{th;\mu=0}$, both defined in Sect. 2.1, with respect to the data set specified in the "C" column. In column three, "1" stands for AME1989, "2" for AME2003, "3" for masses in AME2011 that were not in AME2003, "4" for AME2012, "5" for masses in AME2012 that are not in AME2003, and "6" for masses in AME2012 that are not in AME1989. The top line gives the original model constants [9]. When no values are given, the set on the line just above is used. The value "0" in the L column indicates L was fixed at zero. See the text for additional discussions.

this new data set. This represents step 2 in Fig. 1. If we adjust the model to AME2003, rather than to AME1989 as was done for the model version (92)-b, the error decreases by only a small amount 0.0017 MeV and the constants change by only a little (line 6), see also Ref. [83]. In model (07)-b in line 7 we have implemented the results of a full 4D search for the ground-state in a densely spaced grid, step 3 in Fig. 1 and gain 0.02 MeV in accuracy, first reported at OMEG-7 in Sapporo [96]. Line 8, model (11)-b shows the improvement in accuracy, 0.01 MeV, of taking into account the effect of axial asymmetry on the ground state [44, 83, 45, 87]. corresponding to step 4 in Fig. 1 leading to an accuracy gain of 0.01 MeV. The next line shows how well the model at this stage "predicts" the masses that are new in AME2011 relative to AME2003. At this time, in 2011, we realized that the density-symmetry constant *L* which had been kept at zero in FRDM(1992) (because of a very flat surface "S", see Eq. 8) could now be determined due to several developments: 1) our model is more accurate, 2) the experimental masses are more accurate, and 3) we adjust to a 30% larger data base. Accounting for the density-symmetry effect leads to a further improvement in accuracy by about 0.02 MeV, corresponding to step 5 in Fig. 1 and line 10 in Table D. The next line shows how this stage (11)-a extrapolates to the new region "3", see Ref. [87]. To get some estimate of uncertainties we adjust the model to the

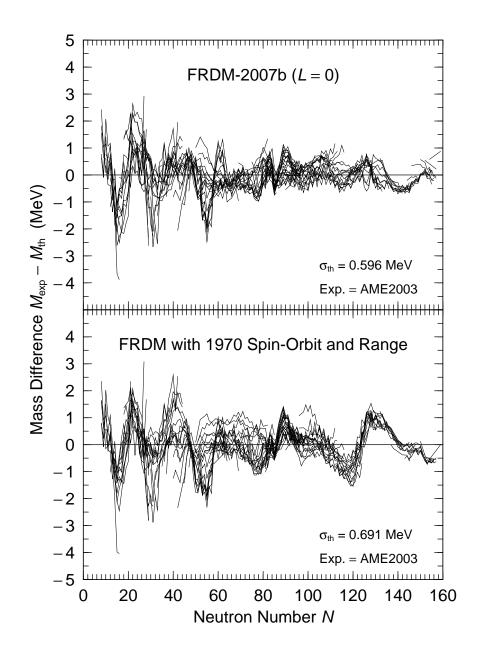


Fig. 36: Differences between experimental masses and FRDM masses for two different single-particle spin-orbit strengths and two different diffuseness parameters. See text for further discussion. The figure was originally published in Ref. [91].

smaller data set AME1989 with L fixed at 0 (line 12) and with also L varying (line 13). Also with this data set we get an improvement in accuracy of about 0.02 MeV and an uncertainty estimate for the density symmetry coefficient $L = 70 \pm 15$ MeV, and the symmetry energy coefficient $J = 32.5 \pm 0.5$ MeV, see Ref. [87].

As discussed in Sect. 4 we have now implemented the final step leading to FRDM(2012), namely an improved calculation of ground-state correlation energies, resulting in a further 0.01 MeV improvement in accuracy entered as line 14 in Table D and step 6 in Fig. 1. Due to space limitations sideways in the table, we have not entered the values of the constants to the precision we recommend in actual use of the model; the more accurate values given above should be used. When we investigate the extrapability of the model by calculating the accuracy for the 219 new masses in data set 5 we seemingly find a noticeable divergence from 0.5595 to 0.6440, an increase of 15%, see line 15. However this increase is due to two outliers, ${}^{25}_{8}\text{O}_{17}$, and ${}^{51}_{19}\text{K}_{17}$ (${}^{52}_{20}\text{Ca}_{32}$ is not in set 5, it was measured earlier. But in AME2003 it is given as -32.51 ± 0.70 MeV whereas in AME2012 it is given as -34.26 ± 0.06 MeV(!).) discussed in Sect. 5.1 in connection with Fig. 15. If these two nuclei are removed from the 219 nuclei in data set 5 we obtain $\sigma_{th} = 0.5706$ MeV. So the 15% increase when we compare to this limited set of new nuclei does not prove a divergence of the mass model away from the region of adjustment. It is highly likely it is just a statistical fluctuation; see also the more

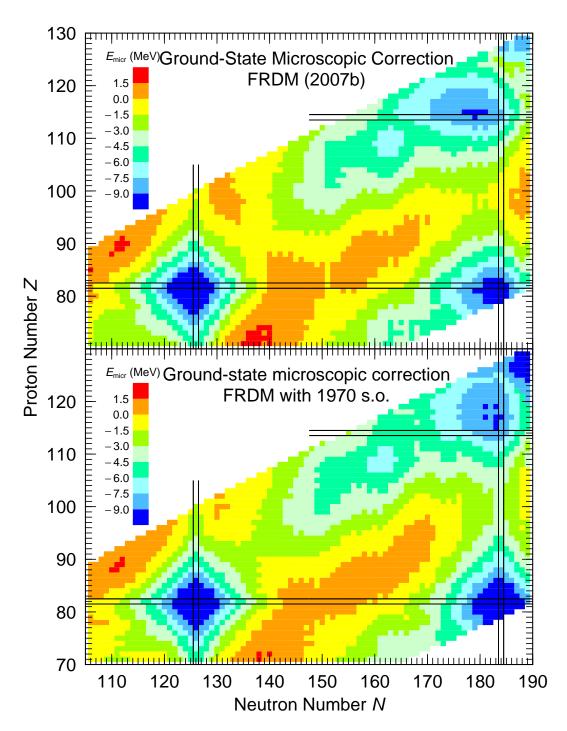


Fig. 37: Calculated microscopic corrections in FRDM models with two different single-particle parameter sets. It is somewhat remarkable that quite different single-particle potentials yield very similar stability properties in the heavy-element region, in particular the stability of the by now well-known region of *deformed* heavy elements in the vicinity of $^{270}_{108}$ Hs is clearly manifested in both results. This figure was originally published in Ref. [91].

extensive tests we discuss next.

We continue with some sensitivity studies. Line 16 shows the agreement of FRDM(2012) with the entire data set AME2012, of which 219 masses were not used in the determination of the model parameters. The error is 0.5728 MeV in this region. When the whole data set is used in the determination of model parameters the error decreases only very marginally, to 0.5711 MeV, line 17. In line 18 we adjust the model to the more limited data set AME1989. When we compare this mass table to AME2012 we obtain the error 0.5764 MeV, line 18. Although 730 nuclei in this evaluation were not used in the determination of the parameters of model (12)-c the error for the entire region is only 0.5764 - 0.5711 = 0.0053 MeV larger than when all nuclei in AME2012 were included in the determination of the parameters (line 17). We therefore conclude that the model is very reliable (so far) when applied to nuclei outside the region of adjustment. How (12)-c extrapolates to a region that just contains new nuclei is on line 20, see Fig. 14 for a graphical illustration.

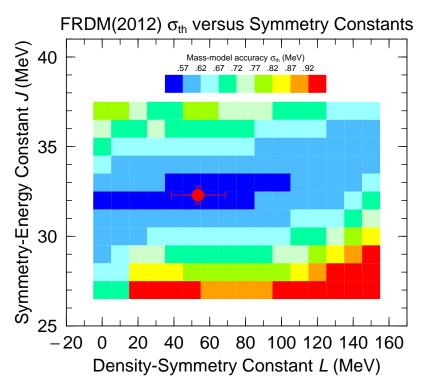


Fig. 38: Calculated mass model accuracy for different combinations of L and J. The best accuracy, is obtained for the L and J in the FRDM(2012), line 14 in Table D, and is indicated with a red dot with uncertainty bars.

In lines 21–24 we do equivalent studies as in lines 17–20, but with L=0. By comparing lines 23 and 21 we note that also with L=0 the model extrapolates extremely well. But we again observe that the inclusion of density-symmetry effects improve accuracy by about 0.02 MeV (compare lines 17 and 21).

We have in our discussion above fixed the compressibility constant to K = 240 MeV. It is of interest to study (as was done in Ref. [9])) how the model accuracy and the values of the model constants depend on K. Lines 25–32 in Table D show the results of such a study when K is fixed at different values. Line 28 shows the value K = 256 MeV is obtained when K is varied freely together with the other nine macroscopic constants.

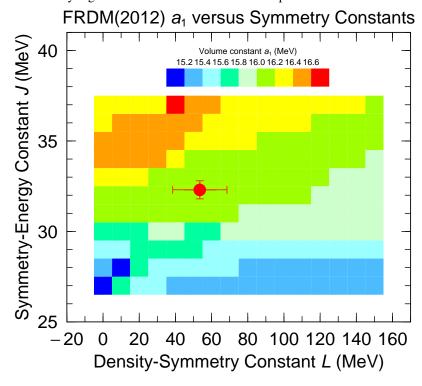


Fig. 39: Values of the volume constant that is obtained when the mass model is optimized with respect to seven macroscopic constants for 176 different value combinations or L and J. The values of these constants in the FRDM(2012) is indicated by a red dot with uncertainty bars.

We have also investigated the sensitivity of the mass model to some essential single-particle model parameters, namely the spin-orbit strength λ and potential diffuseness constant a_{pot} . Traditionally in single-particle models these are determined by comparing calculated and experimental single-particle levels. The process is somewhat ambiguous because observed nuclear levels are not single-particle levels. In the folded-Yukawa single-particle model the spinorbit strengths and diffuseness constants originally used were $\lambda_p = \lambda_n = 32.0$ and $a_{pot} = 0.9$ fm [10]. These parameters were determined mainly by adjusting to levels in ²⁰⁸Pb, see Ref. [37]. In 1973, during an extended visit to Los Alamos by PM and Sven-Gösta Nilsson, it was observed that this original choice led to a poor description of levels in deformed nuclei [37, 91] and new parameters were determined for the actinide region and for the rare-earth region [37]. Somewhat later, see Ref. [1], these studies served as a basis for a global prescription for the spin-orbit strength and diffuseness constant leading to Eqs. 89 and 90 for the proton and neutron spin-orbit strengths and to the value $a_{\rm pot} = 0.8$ fm for the potential diffuseness constant, see Sect. 2.12. At the time when we studied the sensitivity of mass model results to the spin-orbit and diffuseness constants, we had developed the model through the third step in Fig. 1, corresponding to line 7 in Table D. We changed the spin-orbit and diffuseness constants to the values used originally and performed a full-fledged mass calculation that included a recalculation of all ground-state shapes in the four-dimensional deformation space discussed in step 3 in Sect. 4. We then, following the standard procedure detailed above, adjusted the macroscopic parameters to optimize agreement with AME2003. In Fig. 36 bottom panel we show the difference between experimental and calculated masses versus neutron number that we obtained. The results are also given as line 33 in Table D. In the top panel we give the corresponding results with the model (07)-b. It is clear that with the original single-particle model parameters, the calculated masses agree less well with experimental masses than with the current choice of spin-orbit strength and potential diffuseness constant. In fact the calculation is even less accurate than the results with the previous FRDM(1992). A particularly interesting observation is that the current spin-orbit and diffuseness strengths were chosen without any consideration of nuclear masses; in their determination only levels were considered [37]. This result shows that the model is working as a model should; if the model is enhanced so that better agreement with one type of experimental data is obtained, then better agreement with other types of data automatically follows and the model describes many different types of data in a consistent fashion.

We also investigate how the two calculations differ in the superheavy-element region. In Fig. 37 we show calculated microscopic corrections for nuclei from the Pb region to the SHE region calculated with the two different parameter sets. In this type of plot both calculations seem to give very similar results. In particular they both show large negative shell corrections centered around ²⁷⁰₁₀₈Hs₁₆₂. This is a result that is quite insensitive to macroscopic-microscopic model formulations within a very large parameter space. Macroscopic-microscopic calculations based on the Woods-Saxon model obtain results very similar to those in Fig. 37, see for example the review in Ref. [97] which again shows how robust these results are in reasonably realistic nuclear-structure models.

In the study with the original single-particle parameters we have also investigated the effect of varying L, see line 34 in Table D. The effect is very small, which shows that this formulation (non-optimum spin-orbit and potential diffuseness) has the consequence that the model is too inaccurate to allow clear manifestations of density-symmetry effects.

One may ask how correlated the values of J and L are in the FRDM(2012). To investigate this we have optimized the mass model with respect to seven other macroscopic constants (K is kept fixed in this investigation) for different combinations of J and L. Specifically we consider L = 0(10)150 and J = 27(1)37 in units of MeV, for a total of 176 grid points. For each combination we start the minimization at 1440 different starting combinations of the seven parameters that are varied. Sometimes several minima are obtained; in Fig. 38 we show the lowest minimum σ_{th} obtained at each gridpoint. In Fig. 39 we show corresponding values of the volume constant a_1 . This constant is normally assumed to be close to 16 MeV. However, some distance from the values of L and L that optimize the mass model accuracy the value of L and L are also varied) are all within a realistic range.

The optimal values of the asymmetry variables J and L that we obtained from the mass model FRDM (2012) study are

$$J = 32.3 \pm 0.5 \text{ MeV}$$

 $L = 53.5 \pm 15 \text{ MeV}$

The above optimal L value is somewhat smaller than the value in Ref. [98], because we have implemented a more accurate calculation of the zero-point fluctuation effect, see Sect. 2.11. These symmetry energy coefficients have been extensively studied by various experimental and theoretical methods because of their strong impact on astrophysical observables such as the neutron star mass and radius and also simulations of supernovae explosions [68]. The experimental and theoretical methods adopted to extract these values are: mass-fragmentation studies of heavy-ion collisions [99, 100], pigmy dipole resonances (PDR) [101, 102], dipole polarizability in 208 Pb [103, 104], anti-analogue giant dipole resonances [105, 106], isospin dependence of giant monopole resonances [107, 108, 109], isobaric analogue states [110], constraints from observations of masses and sizes of neutron stars [111, 112], chiral effective field theories [113], and quantum Monte-Carlo simulations [114]. Compared with the constraints from these studies, our optimal values for J and L are very consistent with those from neutron star studies, PDR and dipole polarizability.

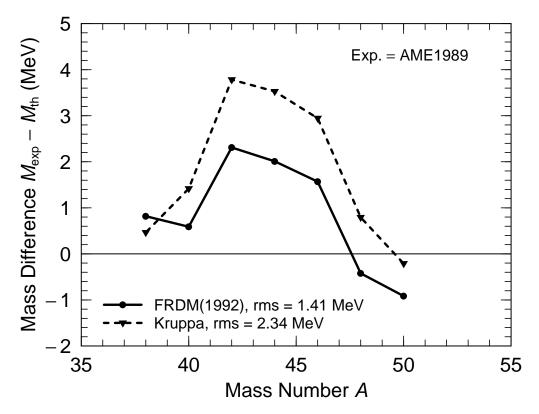


Fig. 40: Deviations between measured and calculated masses for the Ca isotope chain calculated with two models for the shell+pairing corrections. We use these isotopes as a testbed for ideas for improving the mass model in the light region of the nuclear chart. One of the methods is the Strutinsky shell-correction method, the other the Kruppa model.

6.1. Can the deviations below $N \approx 65$ be decreased?

In a model of the relative conceptual simplicity of the FRDM(2012), although execution of actual calculations does involve substantial effort, one must expect some limit to how accurate it can eventually become. In our case we have managed to find remedies that removed various types of correlated deviations. In the 1981 mass model we noted that this type of correlated deviations in regions near 222 Ra and 252 Fm could be removed by searching for ground-state minima in a more general deformation space that included the four shape variables we explore accurately here; earlier somewhat less complete calculations are in [1, 27, 9]. In particular, minimizations with respect to ε_3 reduced many of the deviations near 222 Ra and minimizations with respect to ε_6 , those near 252 Fm [1, 9]. The deviations in the light region in the current calculation look correlated and that could possibly hint that a remedy can be found. We have investigated several ideas, but they all were unsuccessful in removing the deviations. If they had been successful we would obviously have included the methods in our calculations of masses. But, although the ideas were unsuccessful we feel it is useful to give a brief discussion of these investigations. We looked at four different possibilities, namely

- 1. Possibly more optimum spin-orbit strength and potential diffuseness constants could be found.
- 2. The zero-point energy calculations might be improved if we instead of using a phenomenological renormalized irrotational-flow inertia used a more microscopic cranking-model inertia.
- One could have some concerns about the particular version of the Strutinsky normalization we use, which is the original version, and how it would perform for light nuclei in particular, so we have investigated an alternative formulation proposed by Kruppa.
- 4. Some deviations are clearly outside the current model, such as the deviations near Z = 40 and N = 56 which we commented on above. We investigated if a tensor force could improve the accuracy in the light region.

In some of these studies we used masses in the Ca isotope chain to test the ideas for improvement for two reasons. First, these nuclei are all calculated to be spherical in shape. We assumed that also with new features implemented they would remain spherical so we would only have to do calculations for this one shape for each of the isotopes with known masses (now 36 Ca $^{-52}$ Ca). Second, the deviations are large and highly variable across the isotope chain, with an rms deviation of about one and a half MeV in both the FRDM(1992) and FRDM(2012) so it is a good test to investigate if a new model feature can significantly decrease these deviations. The deviations are very similar in both FRDM(1992) and FRDM(2012), because all shapes are spherical and it is mainly shell-plus-pairing corrections for identical shapes that determine the fluctuations in the deviations.

6.1.1. Improved choice of spin-orbit and single-particle potential diffuseness constants

To study the possibility that a different choice of proton and neutron spin-orbit strengths and a different choice of the diffuseness constants would improve the calculated masses we calculated masses along the Ca isotope chain for

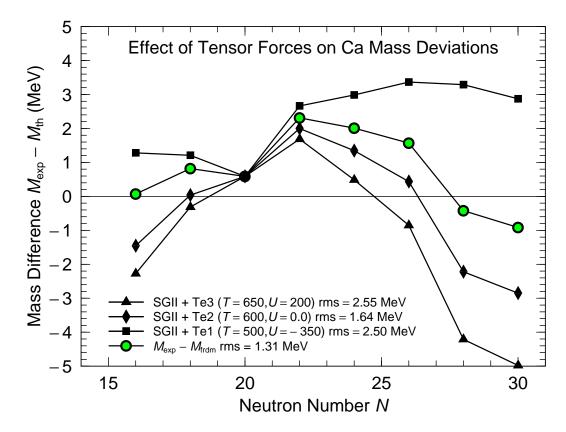


Fig. 41: Effect of tensor force on Ca-isotope mass deviations. The large filled circles show the mass deviations in the FRDM(2012) mass model. The three other curves show how these are modified due to the effect of different tensor forces. It seems that the oscillatory behavior of the deviations cannot be eliminated by these tensor forces.

a four-dimensional grid in these constants. The maximum improvement in the calculated masses were less than 15% so we do not consider this possibility to be a viable cure for the deviations in the low-A region. Furthermore these constants would not give a globally improved model, and not even locally do we obtain significantly better results.

6.1.2. Improved determination of zero-point energies

We limited this study to zero-point motion in the ε_2 direction. Rather than using the phenomenological inertia in Eq, 116 we calculated the cranking-model inertia in the ε_2 direction at each calculated ground-state shape and calculated the zero-point energy using this inertia. We renormalized the cranking-model inertia by a constant (same for all nuclei) so as to obtain optimum agreement between all calculated masses and experimental data. We found this approach did not perform well. The main reason was that the zero-point energies could vary by a factor of three between neighboring isotopes also in cases where the potential surface stiffness parameters were almost identical. The main reason was the well-known cranking-model feature that at level crossings the cranking-model inertia is very sensitive to small details of the level crossing. Slightly better results might have been obtained by varying the ground-state deformation and minimizing the sum of the potential energy and zero-point energy. This would have been a massive effort with limited chances of success so we did not investigate this possibility.

6.1.3. Alternative shell-plus-pairing calculation

Here we investigate the alternative shell-correction model put forward in Ref. [115, 116]. But the masses calculated with this method show very similar fluctuations with respect to experimental data for the isotopes along the Ca chain, see Fig. 40. And, we recall that very early on it has been pointed out that one can expect decreasing accuracy of Strutinsky-type calculations with decreasing nucleon number *A* [117, 10].

6.1.4. Effect of a tensor force

In this study we have not incorporated a tensor force in the macroscopic-microscopic model which would be a monumental effort. Rather, to get a rough idea of the possible benefits of a tensor force, we study its possible impact indirectly. We calculate masses in an HFB approach with several different Skyrme forces without and with tensor terms. We use a specific case to illustrate our strategy. For example we calculate binding energy of ⁴⁰Ca and ⁴²Ca in the HFB approach without a tensor force. Then we calculate the binding energies for the same nuclei with the tensor force. We then argue that the effect of the tensor force is the difference in the change in the binding energy between the two calculations. We repeat this for other Ca isotopes. We then modify the errors calculated in the FRDM with the effect of the tensor force determined in this way.

For our calculations we use the Skyrme-type tensor interaction [118], which is the sum of the triplet-even and triplet-odd zero-range tensor parts,

$$v_{T} = \frac{T}{2} \left\{ \left[(\vec{\sigma}_{1} \cdot k')(\vec{\sigma}_{2} \cdot k') - \frac{1}{3} (\vec{\sigma}_{1} \cdot \vec{\sigma}_{2}) k'^{2} \right] \delta(\vec{r}_{1} - \vec{r}_{2}) \right.$$

$$+ \delta(\vec{r}_{1} - \vec{r}_{2}) \left[(\vec{\sigma}_{1} \cdot k)(\vec{\sigma}_{2} \cdot k) - \frac{1}{3} (\vec{\sigma}_{1} \cdot \vec{\sigma}_{2}) k^{2} \right] \right\}$$

$$+ U \left\{ (\vec{\sigma}_{1} \cdot k') \delta(\vec{r}_{1} - \vec{r}_{2})(\vec{\sigma}_{2} \cdot k) - \frac{1}{3} (\vec{\sigma}_{1} \cdot \vec{\sigma}_{2}) \left[k' \cdot \delta(\vec{r}_{1} - \vec{r}_{2}) k \right] \right\}, \tag{123}$$

where the operator $k = (\overrightarrow{\nabla}_1 - \overrightarrow{\nabla}_2)/2i$ acts on the right and $k' = -(\overleftarrow{\nabla}_1 - \overleftarrow{\nabla}_2)/2i$ on the left. The coupling constants T and U denote the strength of the triplet-even and triplet-odd tensor interactions, respectively. The tensor terms (123) give contributions to the binding energy and to the spin-orbit splitting that are proportional to the spin-orbit density \vec{J} . In spherical nuclei only the radial component of this vector does not vanish and is

$$J_q(r) = \frac{1}{4\pi r^3} \sum_{i \in q} v_i^2(2j_i + 1) \left[j_i(j_i + 1) - l_i(l_i + 1) - \frac{3}{4} \right] R_i^2(r), \tag{124}$$

where i = n, l, j runs over all states and q = 0(1) stands for neutrons (protons). The quantity v_i^2 is the occupation probability of each orbit and $R_i(r)$ is the radial part of the HF single-particle wave function. Furthermore, we observed that the exchange part of the central Skyrme interaction gives the same kind of contributions to the total energy density. The tensor contributions give extra terms to the energy density that read

$$\delta E = \frac{1}{2}\alpha(J_n^2 + J_p^2) + \beta J_n J_p.$$
 (125)

where $\alpha = \alpha_C + \alpha_T$ and $\beta = \beta_C + \beta_T$. The central exchange contributions are given by

$$\alpha_C = \frac{1}{8}(t_1 - t_2) - \frac{1}{8}(t_1 x_1 + t_2 x_2), \quad \beta_C = -\frac{1}{8}(t_1 x_1 + t_2 x_2), \tag{126}$$

in terms of the parameters of the Skyrme force as defined in Ref. [119] and the tensor part reads

$$\alpha_T = \frac{5}{12}U, \quad \beta_T = \frac{5}{24}(T+U),$$
(127)

in terms of the triplet-even and triplet-odd terms appearing in Eq. (123).

In Fig. 41 we have plotted the mass deviations in the FRDM(1992) along the Ca isotopes and also the deviations after the calculated masses have been modified with the tensor effect calculated as described above. The energy contribution of the tensor force increases or decreases monotonically, depending on the details of the adopted tensor interactions, from A = 40 to A = 48 and it therefore seems unlikely that any implementation of this type of tensor force can remedy the type of fluctuating deviations with respect to experiment that are present in the FRDM(1992) (and FRDM(2012)) along this isotope chain.

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Z

EXPLANATION OF TABLE

${\bf Table.\ Calculated\ Nuclear\ Ground\text{-}State\ Masses\ and\ Deformations,\ Compared\ to\ Experimental\ Masses\ Where\ Available}$

Proton number. The mass table is ordered by increasing proton number. The corresponding chemical

L	symbol of each named element is given in parentheses.
N	Neutron number.
A	Mass Number.
$oldsymbol{arepsilon}_2$	Calculated ground-state quadrupole deformation in the Nilsson perturbed-spheroid parameterization.
ϵ_3	Calculated ground-state octupole deformation in the Nilsson perturbed-spheroid parameterization.
\mathcal{E}_4	Calculated ground-state hexadecapole deformation in the Nilsson perturbed-spheroid parameterization.
ε_6	Calculated ground-state hexacontatetrapole deformation in the Nilsson perturbed-spheroid parameterization.
eta_2	Calculated quadrupole deformation of the nuclear ground-state expressed in a spherical-harmonics expansion. The exact definition is given by Eq. (38).
β_3	Calculated octupole deformation of the nuclear ground-state expressed in a spherical-harmonics expansion.
eta_4	Calculated hexadecapole deformation of the nuclear ground-state expressed in a spherical-harmonics expansion.
eta_6	Calculated hexacontatetrapole deformation of the nuclear ground-state expressed in a spherical-harmonics expansion.
E_{s+p}	Calculated ground-state shell-plus-pairing correction. For a specific deformation this number is independent of the macroscopic model and depends only on the single-particle model.
$E_{ m mic}$	Calculated ground-state microscopic energy, given by the difference between the calculated ground-state atomic mass excess and the spherical macroscopic energy calculated in in our preferred mass model, the FRDM (2012).
$E_{ m bind}$	Calculated ground-state binding energy, calculated in in our preferred mass model, the FRDM (2012).
$M_{ m th}$	Calculated ground-state atomic mass excess, in our preferred mass model, the FRDM (2012).
$M_{ m exp}$	Experimental ground-state atomic mass excess in the AME2003 evaluation (Nucl. Phys. A 729 (2003) 337).
$\sigma_{ m exp}$	Experimental error associated with the ground-state atomic mass excess in the AME2003 evaluation (Nucl. Phys. A 729 (2003) 337).
$E_{ m mic}^{ m FL}$	Calculated ground-state microscopic energy, given by the difference between the calculated ground-state atomic mass excess and the spherical macroscopic energy calculated in the FRLDM (2012).
$M_{ m th}^{ m FL}$	Calculated ground-state atomic mass excess, in the FRLDM (2012).

We note again that in the table effects of axial asymmetry on the calculated energy quantities are included; only a few nuclei are affected. However, for reasons of space, the listed deformations refer to the ground-state shape obtained when axial asymmetry is not considered. As dicussed in Sect. 4, item 2, these details are available in previous publications.

N	A	ϵ_2	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z =	-8 ((O)															
	•	-0.03	0.20	0.12	-0.02	-0.010	-0.258	-0.122	0.047	-0.62	2.42	128.03	-5.15	-4.74	0.000	2.40	-3.66
9	17	0.05	0.01	-0.12			-0.014	0.152	0.035	1.82	3.74	132.45	-1.49	-0.81	0.000	3.71	-0.04
10				-0.04	0.02	0.010	0.000	0.048	-0.019	1.60		141.84	-2.81	-0.78	0.001	3.42	-1.39
11				-0.04	0.02	-0.010	0.000	0.047	-0.020	2.23		144.95	2.15	3.34	0.003	3.78	3.46
12		0.01			-0.02	0.010	0.000		0.020	1.10		152.98	2.19	3.80	0.001	2.52	3.36
13 14		0.09		0.03 -0.01	-0.03 0.03	0.096 0.000	0.000 0.000	-0.034 0.012	0.027 -0.030	0.37 -1.14		155.15 161.39	8.09 9.92	8.06 9.28	0.012 0.057	2.05 0.76	9.11 10.75
15		0.00		0.00	0.03	0.000	0.000	0.012	-0.030 -0.029	-1.14 -1.89		162.16	17.22	14.61	0.037	0.70	17.83
16		0.00		0.02	0.03	0.001	0.000	-0.023	-0.029	-2.09		165.98	21.48	19.07	0.236	-0.10	21.90
17	25	0.04	0.00	0.02	0.03	0.043	0.000	-0.022	-0.030	-2.03	-0.06	164.91	30.61			0.02	30.82
18		0.00		0.00	0.03	0.000	0.000	0.000	-0.029	-2.06	-0.33		36.19			-0.25	36.16
19		-0.02		0.00	0.03	-0.021	0.000	0.000	-0.029	-2.57		165.50	46.17			-0.26	45.93
20 21		0.00		0.00 -0.05	-0.03	0.000 0.087	0.000 0.000	0.000 0.064	0.030 0.037	-2.87 -2.10		166.82 163.92	52.92 63.89			-0.37 0.05	52.47 63.50
22				-0.10		0.114	0.000	0.131	0.049	-1.84	-1.22		70.76			-0.00	70.99
23	31			-0.12		0.205	0.000	0.170	0.081	-2.15	-2.01		81.50			0.30	82.64
24		0.19	0.00	-0.12		0.216	0.000	0.172	0.083	-2.01	-2.40		89.61			0.22	90.88
25				-0.05	0.00	0.238	0.000	0.083	0.017	-1.64			103.64			-0.03	102.60
26 27		0.17 -0.28		0.04	0.04	0.187	0.000	-0.032	-0.046	-1.39			112.72			0.10	111.74
					0.04		0.000	0.137	-0.068	-2.62		153.57				-0.70	123.47
28 29		-0.32 -0.27				-0.322 -0.276	0.000 0.000	0.167 0.090	-0.078 -0.056	-3.40 -3.07		152.82 146.10				-0.39 -0.82	133.39 145.99
		-0.20				-0.208	0.000		0.047	-2.61		143.61				-1.14	155.81
31	39	-0.20	0.00	0.06	-0.04	-0.209	0.000	-0.049	0.049	-3.07		138.81				-1.59	168.83
32	40	-0.15	0.00	0.12	-0.04	-0.158	0.000	-0.124	0.060	-3.12	-4.78	138.21	178.38			-1.85	179.20
		-0.15				-0.159		-0.124	0.069	-3.26		133.19				-2.12	192.79
34	42	-0.17	0.00	0.08	-0.05	-0.179	0.000	-0.076	0.062	-2.66	-3.74	128.40	204.34			-1.49	204.49
Z =	9 (F)															
8				-0.12		0.061	0.000	0.152	0.035	1.24		129.22	0.95	1.95	0.000	3.11	2.01
9 10				-0.12 -0.12		0.180	0.000	0.165	0.054	2.93		136.73	1.51	0.87	0.001	5.93	0.85
11				-0.12 -0.10	0.02	0.262 0.283	0.000 0.000	0.180 0.159	0.025 0.021	2.43 2.83		148.51 154.18	-2.19 0.20	-1.49 -0.02	0.000 0.000	5.77 6.14	-1.12 1.23
12				-0.05	0.03	0.270	0.000	0.092	-0.010	2.15		162.95	-0.49	-0.05	0.002	4.96	0.55
13	22	0.21	0.00	-0.03	0.03	0.226	0.000	0.058	-0.020	2.04	4.39	167.59	2.93	2.79	0.012	4.36	3.87
14				-0.06	0.03	0.117	0.000		-0.021	1.07		174.70	3.90	3.33	0.080	2.91	4.77
15				-0.06	0.03	0.095	0.000	0.077	-0.023	0.52		177.60	9.07	7.56	0.072	2.43	9.80
16 17		0.11		-0.04	-0.03 -0.03	0.119 0.118	0.000 0.000	0.054 0.004	0.037 0.030	0.19 0.19		181.85 182.80	12.89 20.01	11.27 18.27	0.098 0.167	2.20 2.26	13.47 20.35
18		0.11		0.00	0.03	0.118	0.000		-0.030	0.10		185.65	25.24	24.93	0.377	2.12	25.40
19				-0.00	0.03	0.118	0.000	0.007	-0.030 -0.029	-0.10		185.90	33.06	∠ 1 .73	0.511	1.81	33.03
20				-0.01	-0.03	-0.031	0.000	0.013	0.029	-0.56		187.81	39.21			1.48	39.00
21				-0.07		0.111	0.000	0.091	0.042	-0.29		187.13	47.97			1.54	47.96
22				-0.12		0.205	0.000	0.170	0.081	-1.00		188.68	54.49			1.87	55.52
23				-0.12	0.02	0.229	0.000	0.173	0.019	-1.22		186.52	64.72			1.61	65.00
24 25				-0.12 -0.08	0.04 0.04	0.249 0.281	0.000 0.000	0.178 0.133	0.001 -0.009	-1.43 -1.36		187.00 183.96	72.31 83.42			1.17 1.13	72.61 83.03
26				-0.04	0.04	0.259	0.000			-0.94		182.94	92.52			1.00	91.68
27		0.26		0.07	0.04	0.292	0.000		-0.057	-1.32		180.41				0.80	102.58
		-0.30				-0.302	0.000	0.163	-0.076			181.80				0.07	111.26
29		-0.27				-0.275	0.000		-0.059	-2.14		176.87				-0.13	122.74
		-0.20 -0.20		0.00		-0.206 -0.210	0.000	0.013 -0.115		-1.43 -2.12		174.05 171.84				-0.41 -0.46	132.44 144.57
		-0.20 -0.20				-0.210 -0.210		-0.115 -0.115	0.064	-2.12 -1.93						-0.46 -0.25	155.27
		-0.17				-0.179		-0.076		-1.76						-0.71	167.45
		-0.17				-0.179		-0.076		-1.37							178.86
		-0.20	0.00	0.12	-0.05	-0.210	0.000	-0.115	0.073	-1.64	-3.41	157.42	190.67			-0.05	192.12
36	45	0.28	0.00	-0.12	-0.05	0.320	0.000	0.195	0.115	-2.06	-5.45	156.19	199.98			0.10	203.64

N	A	$arepsilon_2$	ϵ_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
- Z	= 9 (F)															
	46		0.00	-0.12	-0.05	0.263	0.000	0.182	0.103	-2.08	-5.16	150.59	213.65			0.00	216.97
\boldsymbol{z}	= 10	(Ne)															
		-0.01	0.00	0.12	-0.02	-0.008	0.000	-0.139	0.024	0.92	2.89	134.37	3.10	5.32	0.000	2.93	3.77
	19			-0.12		0.269		0.182	0.070	1.98		144.67	0.87	1.75	0.000	5.43	1.53
	20 21			-0.12 -0.08	0.02	0.304	0.000	0.207 0.157	0.046 0.016	0.80 1.50		160.81 166.96	-7.21 -5.29	-7.04 -5.73	0.000 0.000	5.08 5.69	-6.39 -4.49
12	22			-0.03	0.03	0.384			-0.007	0.94		177.97		-8.02	0.000	4.75	-7.34
	23			-0.03	0.03	0.316			-0.014	1.78		182.69	-4.87	-5.15	0.000	4.74	-4.04
	24 25	-0.06 0.05		-0.01 0.00	0.03	-0.063 0.053			-0.030 -0.030	2.02 1.61		192.61 195.62	-6.72 -1.66	-5.95 -2.11	0.000 0.026	2.70 2.69	-5.93 -0.98
	26	0.03		0.05	0.03		0.000	-0.052		1.16		202.25	-0.22	0.43	0.020	2.23	-0.98 0.41
17	27	0.11	0.00	0.02	0.03	0.119	0.000	-0.017	-0.032	1.15	2.59	203.38	6.72	7.07	0.110	2.64	7.18
	28	-0.02		0.00	0.03	-0.021			-0.029	1.07		208.55	9.62	11.24	0.147	2.10	9.91
	29 30	-0.03 0.00		0.00 0.00	0.03	-0.031	0.000		-0.029 -0.029	0.61 0.01		208.71 212.44	17.53 21.87	18.06 23.10	0.269 0.571	2.32 2.01	17.67 21.85
21				-0.06	-0.04	0.111		0.079	0.051	0.44		212.33	30.06	23.10	0.571	1.83	30.23
22	32	0.23	0.00	-0.12	-0.03	0.259	0.000	0.180	0.080	-1.11	0.81	215.27	35.19			2.28	36.23
	33			-0.11	0.04	0.304		0.178	0.008	-1.80		213.91	44.62			1.59	44.97
	34 35			-0.10 -0.07	0.04 0.04	0.315 0.303		0.168	0.005 -0.009	-2.15 -1.77		215.81 213.44	50.79 61.23			1.16 0.93	51.01 60.97
	36			-0.03	0.04	0.316		0.079	-0.024	-1.56		213.97	68.77			0.86	68.18
27	37	0.35	0.00	0.11	0.04	0.403	0.000	-0.068	-0.075	-2.61	-1.09	212.52	78.30			0.39	78.58
		-0.30				-0.302			-0.076		-2.38		85.12			0.38	86.57
29 30		-0.27 0.23		-0.03	0.02	-0.276 0.250		0.059 0.027	-0.030 -0.037		-0.43 -0.72	208.31	98.65 107.09			0.09 -0.24	97.74 106.06
31		-0.17				-0.178				-1.36						-0.38	117.92
		-0.17				-0.179			0.062	-1.13						0.09	127.60
	43 44	-0.28 0.21			-0.05 -0.05	-0.292		-0.086 -0.083	0.075 0.031	-1.57 -1.03		199.89 196.56				0.21 0.44	140.21 150.17
	45			-0.12		0.231		0.195	0.031			195.47				0.38	163.04
	46			-0.12		0.318		0.194	0.103	-2.32		192.93				0.45	173.32
	47			-0.12	0.02	0.352		0.204	0.044			186.34				-0.16	186.03
	48 49			-0.12 -0.12	0.03 0.05	0.351 0.348	0.000	0.204 0.204		-2.25 -2.45							196.69 209.76
	50			-0.12		0.332		0.169		-2.10							221.14
41	51	0.32	0.00	-0.12	0.06	0.347	0.000	0.205	0.000	-2.63	-4.21	171.04	232.78			-1.34	234.20
\boldsymbol{z}	= 11	(Na)															
		-0.01		0.12		-0.005				1.25		133.28	11.47	12.93	0.012	2.99	11.67
	20 21			-0.11 -0.10	0.02 0.03	0.317 0.372		0.180 0.183	0.031 0.027	1.70 0.92		146.20 162.95	6.62 -2.06	6.85 -2.18	0.007 0.001	5.39 5.17	6.83 -1.67
	22			-0.04	0.03	0.384			-0.002	1.72		172.93		-5.18	0.000	5.91	-4.87
12	23	0.35	0.00	0.00	0.03	0.386	0.000	0.059	-0.021	1.21	5.20	185.85	-8.82	-9.53	0.000	5.10	-8.21
	24	0.32		0.01	0.03	0.353			-0.027	2.33		192.42		-8.42	0.000	5.51	-6.70
	25 26	0.26	0.00	-0.01 0.02	0.02 0.03	0.283 0.263			-0.013 -0.033	2.09 2.21		201.94 207.09	-8.76 -5.84	-9.36 -6.86	0.001	4.53 4.49	-8.09 -5.22
	27	0.25		0.06	0.03			-0.041		1.51		214.29	-4.97	-5.52	0.004	4.02	-4.35
	28	0.21		0.05	-0.03			-0.045	0.019	2.09		217.95		-0.99	0.013	3.86	-0.06
		-0.06		0.01	0.03			-0.011		2.42		223.78	1.68	2.66	0.013	3.16	2.07
	31	-0.04 0.00		0.01	0.03 0.04	-0.042 0.000		-0.011 0.000	-0.029 -0.039	2.07 1.38		225.85 229.86	7.69 11.75	8.36 12.65	0.025 0.211	3.31 3.18	7.95 11.93
21	32	0.11	0.00	-0.05	-0.04	0.121	0.000	0.067	0.050	1.72	2.78	231.24	18.44	19.06	0.356	3.04	18.65
	33			-0.12	0.04	0.249		0.178	0.001	0.09		234.25	23.49	24.89	0.875	3.21	24.01
	34 35			-0.11 -0.08	0.04 0.04	0.293 0.314		0.175	0.005 -0.004	-0.97 -1.30		234.92 237.09	30.90 36.80			2.60 2.06	31.24 36.86
	36			-0.08 -0.04	0.04	0.314			-0.004 -0.020			236.34	45.62			1.82	45.31
	37		0.00	0.00	0.04		0.000		-0.034			237.49	52.54			1.58	52.08

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 11	(Na)															
	38	0.35	0.00	0.10	0.04	0.401	0.000	-0.056	-0.071	-2.40	-0.13	237.37	60.74			0.93	60.87
	39	0.35		0.11	0.04			-0.068		-2.49		238.04	68.14			0.74	68.44
29	40	0.28	0.00	0.05	0.04	0.312	0.000	-0.020	-0.052	-1.20	-0.22	235.49	78.76			0.41	78.22
	41	0.22		0.01	0.05		0.000		-0.050	-0.69		234.64	87.68			0.79	87.04
31	42	0.22	0.00	0.01	0.05	0.240	0.000	0.014	-0.050	-0.72	0.15	231.93	98.46			0.79	97.75
	43	0.22		0.00	0.05		0.000		-0.048	-0.54		230.84	107.62			0.86	106.86
	44	0.22		0.01	0.05		0.000	0.014	-0.050	-0.57		227.60	118.93			0.91	118.16
	45	0.22			-0.05		0.000	-0.057	0.035	-0.31		225.76	128.85			1.29	128.12
	46 47		0.00	-0.08 -0.07	-0.05		0.000 0.000	0.145 0.131	0.097 0.091	-1.68 -1.46		224.21 222.02	138.46 148.73			1.25 1.27	139.82 149.92
	48 49			-0.12 -0.12	0.03		0.000 0.000	0.200 0.208	0.030 0.014	-1.84 -1.81		217.76 215.72	161.06 171.17			0.77 0.53	161.60 171.89
	50			-0.12 -0.05	-0.02		0.000	0.208	0.014	-1.74		210.20	184.76			0.50	184.45
	51			-0.05	0.00		0.000	0.115	0.032	-1.61		207.10	195.94			0.38	195.26
41	52	0.33	0.00	-0.06	0.02	0.361	0.000	0.127	0.015	-1.96	-0.87	202.72	208.38			-0.09	207.76
42	53	0.31	0.00	-0.09	0.06	0.336	0.000	0.162	-0.016	-1.89	-2.23	200.93	218.25			-0.25	218.91
43	54			-0.06	0.06	0.359	0.000	0.131	-0.026	-2.17	-2.27	195.83	231.42			-0.78	231.69
44	55	0.33	0.00	-0.05	0.06	0.359	0.000	0.118	-0.030	-2.01	-2.21	192.31	243.01			-0.75	243.37
\boldsymbol{z}	= 12	(Mg)															
	20	_	0.00	-0.09	-0.02	0.122	0.000	0.118	0.037	0.21	1.65	136.48	15.56	17.57	0.027	1.78	15.32
	21	0.29	0.00	-0.03	0.03	0.316	0.000	0.078	-0.014	1.34		150.19	9.92	10.91	0.016	4.15	9.78
10	22	0.35	0.00	-0.04	0.03	0.384	0.000	0.109	-0.002	0.57	4.24	169.14	-0.96	-0.40	0.001	4.20	-0.85
	23	0.35		0.02	0.03		0.000		-0.029	1.23		181.22	-4.97	-5.47	0.001	4.89	-4.74
12	24	0.35	0.00	0.06	0.03	0.393	0.000	-0.012	-0.046	0.78	4.44	197.38	-13.06	-13.93	0.000	4.39	-12.65
	25	0.31		0.05	0.03				-0.042	1.81			-12.23		0.000		-11.76
		-0.35		-0.11	0.03	-0.351		0.162	-0.070	0.79			-16.22		0.000		-15.57
	27 28	0.25 0.25		0.05	-0.03 -0.03			-0.037 -0.073	0.017 0.008	1.90 1.26			-13.00 -14.09		0.000		-12.45 -13.50
	29	0.23		0.06				-0.073 -0.057	0.008	1.26			-14.09 -10.16		0.002	3.70	-9.64
	30	0.11		0.01	0.03			-0.005	-0.031	2.21		242.17	-9.42	-8.91	0.008	3.41	-8.97
		-0.05		0.01	0.03			-0.003	-0.031 -0.038	2.10		244.97	-9.42 -4.14	-3.22	0.012	3.30	-3.77
	32	0.00		0.00	0.04		0.000	0.000	-0.039	1.39		250.78	-1.89	-0.95	0.018	3.11	-1.60
21	33	0.11	0.00	-0.04	-0.04	0.120	0.000	0.054	0.048	1.80	3.05	252.24	4.72	4.89	0.020	3.24	5.01
22	34	0.20	0.00	-0.09	0.00	0.218	0.000	0.131	0.028	0.69	2.76	256.93	8.11	8.81	0.231	3.17	8.49
23	35	0.25	0.00	-0.09	0.04	0.270	0.000	0.144	-0.006	-0.35	2.26	257.88	15.23			2.72	15.53
	36			-0.05	0.04		0.000		-0.017	-0.90		261.62	19.56			2.20	19.61
	37	0.28		0.00	0.04		0.000		-0.035	-0.95		261.37	27.89			1.92	27.72
	38 39	0.29		0.03 0.10	0.04		0.000		-0.045	-1.18		264.29	33.03			1.54 0.93	32.87
		0.35					0.000		-0.071			264.25	41.14				41.43
				-0.12 -0.06		-0.312 -0.276			-0.077 -0.056	-2.71 -1.62	-1.31	267.12 263.97	46.34 57.56			0.81 0.91	47.67 57.64
	42	0.22		0.02	0.04		0.000		-0.050 -0.053	-0.82		264.89	64.72			0.49	64.31
	43	0.22		0.02	0.05				-0.055			262.16	75.52			0.77	75.10
	44	0.22		0.03	0.05			-0.010		-0.56		262.17	83.58			1.06	83.15
33	45	0.22	0.00	0.06	-0.05	0.241	0.000	-0.057	0.035	-0.57		259.02	94.80			1.08	94.24
	46	0.23			-0.05			-0.104	0.024	-0.55		258.89	103.00			1.32	102.83
	47	0.22			-0.05			-0.106	0.025	-0.40		255.60	114.36			1.11	114.21
	48			-0.01			0.000	0.056	0.062	-0.92		254.46	123.58			1.43	123.43
	49			-0.01			0.000	0.062	0.064	-1.36		250.72	135.39			1.24	135.29
	50	0.35			-0.05		0.000	0.049	0.058	-1.26		249.28	144.90			1.27	144.71
	51 52	0.35			-0.06		0.000	0.035	0.064		-0.59		156.72			0.88	156.79
	52 53	0.35 0.34			-0.06 -0.04		0.000 0.000	0.035 0.047	0.064 0.048	-1.56 -1.77	-0.80	243.98 238.90	166.34 179.49			0.77 0.40	166.53 179.03
	54	0.34			-0.04 -0.01		0.000	0.047		-1.77 -1.58		236.90	190.34			0.40	189.27
	55	0.35		0.03	0.01		0.000		-0.062				201.40			-0.31	201.82
	56	0.35		0.03	0.06		0.000		-0.062 -0.066				201.40			-0.31 -0.22	212.56
	57	0.35		0.04	0.06		0.000		-0.066								225.57

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} ^{FL} (MeV)
\boldsymbol{Z}	= 12	(Mg)															
46 47			0.00	0.04 0.02	0.06 0.06	0.392 0.366	0.000		-0.066 -0.059	-2.54 -2.97			235.50 248.97			-0.78 -1.31	236.57 249.89
\boldsymbol{Z}	= 13	(Al)															
	21		0.00	0.12	0.03	0.117	0.000		-0.039	-0.59		133.77	25.55			1.11	24.91
9 10	22			-0.05 -0.02	0.03	0.226 0.305	0.000		-0.015 -0.018	1.38 1.32		149.89 168.90	17.50 6.57	6.77	0.019	3.36 3.99	16.94 6.27
11			0.00	-0.02	0.03	0.303	0.000		-0.018 -0.032	1.52		183.18	0.37	-0.06	0.019	3.99 4.74	0.27
12			0.00	0.05	0.03	0.346	0.000		-0.042	1.55		199.71	-8.10	-8.92	0.000	4.50	-8.00
13	26	0.25	0.00	0.02	0.03	0.274	0.000	0.006	-0.033	2.47	4.63	210.69	-11.01	-12.21	0.000	4.55	-11.93
14		-0.40				-0.392	0.000		-0.027	-0.29			-15.81		0.000		-15.47
15 16	28		0.00	0.03		0.218	0.000	-0.021 -0.045	0.014	2.33			-15.64		0.000		-15.23 -16.52
17			0.00 0.00		-0.03 -0.03	0.230 0.151	0.000	-0.043 -0.030	0.019 0.025	1.86 2.61			-16.99 -14.12		0.001 0.014		-16.32 -13.66
	31	-0.12		0.03	0.04		0.000	-0.030		2.27			-15.03		0.020		-14.57
	32		0.00	0.01	0.04	0.054	0.000		-0.040	2.23			-10.85		0.086		-10.44
20			0.00	0.00	0.04	0.032	0.000		-0.039	1.52		265.42	-9.24	-8.53	0.073	3.25	-8.89
21 22				-0.02 -0.03	-0.04	0.097 0.117	0.000	0.027	0.043 -0.036	2.08 1.87		268.23 273.44	-3.98 -1.11	-2.93 -0.13	0.113 0.175	3.63 3.24	-3.68 -0.89
23				-0.03 -0.08	0.04				-0.030 -0.015								
	37			-0.08 -0.05	0.04 0.04	0.236 0.259	0.000		-0.013 -0.022	0.59 0.08		275.54 279.70	4.86 8.77	5.78 9.95	0.215 0.331	3.34 2.82	5.14 8.89
25				-0.01	0.04	0.272	0.000		-0.034	-0.10		281.04	15.50	16.05	0.731	2.48	15.45
	39		0.00		0.04	0.263	0.000		-0.043	-0.20		284.33	20.28	21.40	1.472	1.98	20.19
27	40			-0.12	0.04		0.000		-0.077	-2.10		286.26	26.42			1.51	27.48
28				-0.12		-0.313	0.000		-0.086	-3.03		289.18	31.57			0.87	32.93
29 30				-0.09 -0.05		-0.271 -0.271	0.000 0.000	0.129 0.089	-0.027 0.029	-1.88 -1.13		287.35 288.31	41.48 48.59			0.98 0.97	41.57 48.41
31						-0.274	0.000	0.055	0.037	-0.93		287.16	57.81			0.77	57.43
32	45	-0.27	0.00	-0.02	-0.05	-0.274	0.000	0.055	0.037	-0.59	0.76	287.12	65.92			1.31	65.51
		-0.30				-0.308	0.000	-0.005	0.053	-0.86		285.64	75.47			1.16	75.20
34		-0.36				-0.369	0.000	-0.010	0.058	-1.16		285.62	83.56			1.34	83.55
35 36		-0.38 -0.38	0.00			-0.388 -0.386	0.000	-0.004 0.027	0.058 0.046	-1.12 -0.64		283.38 282.04	93.88 103.29			1.22 1.64	93.84 102.98
37			0.00		-0.05	0.463		-0.019		-1.16		278.62	114.77			1.79	114.05
38	51	0.41	0.00	0.08	-0.06	0.464	0.000	-0.033	0.027	-1.29	1.11	277.60	123.87			1.92	123.44
39			0.00		-0.06	0.390		-0.004		-0.99		274.62	134.92			1.74	134.63
40 41			0.00 0.00		-0.06 -0.06	0.390 0.366	0.000	-0.004 0.016		-0.96 -1.09		273.19 269.96	144.42			1.60 1.27	144.22 155.71
42			0.00		-0.06 -0.04	0.300		-0.016		-1.09		267.26	166.50			1.17	165.77
43			0.00	0.06	0.02	0.393			-0.037			263.67	178.15			0.68	177.49
44			0.00	0.07	0.06	0.397	0.000		-0.078			263.13	186.76			0.55	187.92
45				-0.07	0.05	0.236	0.000		-0.028				199.79			0.18	200.12
46 47				-0.05 -0.02	0.06	0.236 0.294	0.000		-0.044				210.47			0.19	211.06 223.34
					0.06				-0.049				222.79			-0.45	
48 49			0.00 0.00	0.02 0.04	0.07 0.07	0.332 0.312	0.000		-0.070 -0.077				233.13 245.37			-0.42 -0.91	234.64 247.38
50			0.00		0.05	0.318			-0.073				256.85			-0.75	259.14
\boldsymbol{Z}	= 14	(Si)															
	22	0.00		0.02	0.03				-0.029			133.93	32.68			0.22	31.34
				-0.12		-0.232	0.000		-0.057	0.18		151.76	22.93	10.76	0.010	1.89	22.21
				-0.12 -0.12		-0.292 -0.350	0.000		-0.065 -0.073	0.44 0.90		173.33 187.88	9.43 2.95	10.76 3.82	0.019 0.010	2.22 3.19	9.01 2.62
				-0.12		-0.370	0.000		-0.076	0.07		206.11	-7.21	-7.14	0.003	3.42	-7.27
					-0.03	-0.363	0.000	0.187	-0.022	-0.30			-11.53	-12.38	0.000		-11.55
14	28	-0.37	0.00	-0.12	-0.03	-0.363	0.000	0.187	-0.022	-1.52	3.06	234.72	-19.68	-21.49	0.000	3.08	-19.46
						-0.349	0.000		-0.004				-19.01		0.000		-18.76
16	30	-0.23	0.00	-0.02	0.03	-0.236	0.000	0.040	-0.034	1.00	5.14	254.09	-22.90	-24.43	0.000	5.14	-22.53

N A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z = 14	l (Si)															
	-0.21	0.00	0.03	-0.04	-0.218	0.000	-0.014	0.042	1.57	3.14	260.55	-21.29	-22.95	0.000	3.14	-20.89
18 32	-0.12	0.00	0.03	0.04	-0.124	0.000	-0.030		1.59			-22.95		0.000		-22.53
19 33 20 34	-0.04 0.00		0.01	0.04	-0.041 0.000	0.000 0.000	-0.011	-0.038 -0.039	1.67 0.82			-19.67 -19.63		0.016 0.014		-19.27 -19.25
20 34 21 35	-0.05			0.04	-0.052	0.000		-0.039 -0.039	1.66			-19.03 -14.91		0.014		-19.23 -14.57
22 36	0.01		0.00	0.04	0.011	0.000		-0.039	1.67			-13.54		0.123		-13.26
23 37			-0.06	0.02	0.193	0.000		-0.004	1.00			-7.24	-6.58	0.169	3.36	-6.99
24 38			-0.04	0.04	0.226	0.000		-0.028	0.37		300.95	-5.19	-4.07	0.137	2.64	-4.97
25 39 26 40	0.23 0.23		0.00	0.04 -0.04	0.250 0.252	0.000 0.000	-0.027 -0.030	-0.037 0.030	$0.05 \\ -0.28$		302.60 307.05	1.23 4.85	1.93 5.47	0.338 0.556	2.35 2.14	1.33 4.89
					-0.302	0.000	0.178	0.007	-2.73		309.42	10.55	13.56	1.844	1.03	11.25
28 42	-0.31				-0.313	0.000	0.164	-0.086	-3.85		313.99	14.05	15.50	1.011	0.49	15.41
					-0.275	0.000	0.149	0.017	-2.67		312.62	23.50			0.73	23.92
					-0.277 -0.273	0.000 0.000	0.137 0.077	0.019 0.032	-2.10 -1.51		314.96 313.69	29.22 38.57			0.84 0.73	29.56 38.44
					-0.275	0.000	0.043	0.032	-1.08		315.16	45.17			0.96	44.94
	-0.29				-0.297	0.000	0.015		-1.27		313.58	54.82			0.99	54.59
	-0.36				-0.368	0.000	0.000	0.054	-1.80		314.70	61.77			1.25	61.81
	-0.38 -0.44				-0.387 -0.445	0.000 0.000	0.017 0.035		-1.83 -1.93		312.38 312.51	72.16 80.10			1.30 1.75	72.07 80.09
	-0.47				-0.475	0.000	0.033	0.040	-1.73		310.06	90.62			1.79	91.08
38 52	0.47			-0.06	0.465	0.000	-0.045	0.022	-1.74		309.08	99.67			2.22	99.44
39 53	0.41			-0.06	0.465		-0.045	0.022	-1.60		306.23	110.60			1.87	110.32
40 54 41 55	0.35 0.35			-0.06 -0.06	0.391 0.391		-0.029 -0.041		-0.93 -1.19		305.87 302.48	119.03 130.49			1.77 1.55	118.87 130.33
41 55	0.35			-0.00	0.391		-0.041 -0.050		-1.19		301.22	130.49			1.33	139.33
43 57	0.35		0.09	-0.04	0.395		-0.056		-1.58		297.68	151.43			0.91	150.90
44 58	0.33		0.07	0.03	0.371	0.000		-0.050			296.64	160.54			0.95	160.50
45 59 46 60	0.35	0.00	0.09 -0.04	0.04	0.399 0.237	0.000 0.000			-2.19 -1.45		293.67 291.44	171.58 181.88			0.31 0.37	172.34 182.35
47 61	0.26		0.00	0.07	0.237	0.000		-0.047 -0.065		-0.90 -2.00		193.58			-0.20	194.61
48 62	0.27		0.04	0.07	0.301	0.000		-0.077		-2.62		203.19			-0.28	204.86
49 63	0.27		0.06	0.07	0.304			-0.083				215.29				217.50
50 64 51 65	-0.25 0.27		-0.12	0.07 -0.01	-0.256 0.306			-0.097 -0.025								228.42 241.20
52 66	0.30			-0.01	0.339			-0.023 -0.009				250.97			-1.24	252.38
53 67	0.30			-0.03	0.339			-0.009							-1.67	
54 68	0.31	0.00	0.12	-0.03	0.351	0.000	-0.107	-0.011	-3.08	-2.57	262.23	275.67			-1.08	277.43
Z = 15	5 (P)															
8 23	-0.02							0.035				44.28			-0.60	42.85
9 24		0.00		0.03	0.108	0.000		-0.013	-0.45		148.57	33.41			1.65	32.16
10 25 11 26	0.10 0.28		0.12 0.07	0.03	0.117 0.314		-0.134 -0.045		0.56 1.14		171.08 186.85	18.97 11.27			1.63 3.44	18.08 10.47
12 27	0.28		0.09	0.03	0.317		-0.068		0.94		205.96	0.23	-0.72	0.026	3.39	-0.25
13 28	0.20			-0.03	0.218		-0.034	0.021	1.85		220.82	-6.56	-7.16	0.003	3.30	-6.84
	-0.33				-0.331	0.000	0.110	0.002	-0.11			-14.49		0.001		-14.58
	-0.12 -0.21		0.01		-0.125 -0.218		-0.007 -0.014	-0.027 0.042	1.81 1.39			-18.25 -23.06		0.000		-19.17 -22.87
	-0.19				-0.198		-0.041	0.012	1.88			-22.26		0.000		-22.01
18 33	-0.12	0.00	0.04	0.04	-0.124		-0.041	-0.032	1.89	3.08	279.28	-24.66	-26.34	0.001	3.08	-24.33
	-0.06		0.01		-0.063		-0.010	0.001	2.00			-23.04		0.005		-22.70
20 35 21 36	$0.00 \\ -0.06$		0.00 -0.01	0.00	0.000 -0.063	0.000 0.000	0.000	0.000 -0.010	1.23 2.05			-23.52 -20.27		0.002 0.013		-23.19 -19.96
22 37			-0.01	0.02	0.118	0.000		-0.018	1.77			-19.05		0.038		-18.76
23 38	0.18	0.00	-0.02	0.00	0.194	0.000	0.038	0.006	1.47	3.56	309.68	-14.70	-14.76	0.103	3.57	-14.48
24 39			-0.01	0.03	0.227	0.000		-0.026	0.67			-12.85		0.103		-12.63
25 40	0.21	0.00	0.02	0.01	0.229	0.000	-0.004	-0.013	0.37	2.60	319.12	-8.00	-8.11	0.139	2.62	-7.91

N A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z = 15	5 (P)															
26 41	0.22	0.00	0.05	-0.03	0.241	0.000	-0.043	0.018	-0.19	1.94	324.30	-5.11	-5.28	0.216	2.05	-5.01
27 42	0.16			-0.01		0.000	-0.026	0.005	0.01		326.33	0.93	0.94	0.447	1.84	0.86
28 43					-0.271		0.129	-0.027	-2.18		330.82	4.51	5.77	0.969	1.41	4.85
29 44					-0.273		0.077	0.032	-1.59		332.16	11.24			0.93	11.31
30 45					-0.235		0.047	0.040	-0.71		334.73	16.74			1.06	16.71
31 46 32 47	-0.27 -0.27	0.00		-0.05 -0.05	-0.276 -0.277		0.032	0.042 0.048	-0.86 -0.59		334.98 336.80	24.56			1.11	24.47 30.75
	-0.27 -0.27				-0.277 -0.278		0.010 -0.001	0.048	-0.59 -0.65		336.33	30.82 39.36			1.34 1.46	39.26
	-0.29				-0.299		-0.007	0.053	-0.67		337.55	46.21			1.63	46.18
35 50	-0.36	0.00	0.05	-0.05	-0.368	0.000	0.000	0.054	-1.13	1.04	336.44	55.39			1.83	55.42
36 51	-0.36	0.00	0.04	-0.06	-0.368	0.000	0.012	0.059	-0.77	1.29	336.83	63.08			2.31	63.28
37 52		0.00	0.04	-0.06	-0.368		0.012	0.059	-0.47		335.27	72.70			2.28	72.87
38 53		0.00	0.10	0.06	-0.213		-0.096	-0.030	0.81		335.11	80.94			2.55	81.10
39 54 40 55	0.34 0.34			-0.06 -0.06			-0.032 -0.032	0.040 0.040	-0.51 -0.54		332.92 332.66	91.20 99.53			2.32 2.21	91.02 99.40
	0.34															
41 56 42 57		0.00		-0.05 -0.04		0.000	-0.042 -0.024	0.025 0.025	-0.82 -0.39		330.21 328.86	110.05 119.47			1.85 2.13	109.68 118.94
43 58			-0.03			0.000	0.058	0.021	-0.17		326.24	130.16			1.59	129.48
44 59	0.22	0.00	-0.02	0.01	0.238	0.000	0.046	-0.002	-0.45	1.28	324.95	139.52			1.41	138.74
45 60	0.22	0.00	-0.02	0.02	0.238	0.000	0.047	-0.012	-1.19	0.56	322.29	150.25			0.74	149.56
46 61			-0.01	0.03		0.000		-0.025	-1.42		320.89	159.72			0.53	159.21
47 62	0.22		0.01	0.07		0.000		-0.070	-2.08		319.12	169.57			-0.04	170.52
48 63 49 64	0.22 0.22		0.04 0.07	0.02		0.000	-0.025 -0.061	-0.028	-2.04 -2.78		315.73 312.65	181.03 192.18			-0.09 -0.65	180.71 192.38
50 65	0.22		0.07	0.02			-0.001 -0.100		-2.78 -3.19		310.99	201.91			-0.03 -0.70	202.94
51 66	0.26			-0.02				-0.014	-3.59		307.03	213.94			-1.13	215.08
52 67	0.27			-0.02			-0.117		-3.28		304.13	224.92			-0.90	226.24
53 68	0.28	0.00		-0.03	0.316	0.000	-0.114	-0.007	-3.53	-2.65	299.68	237.43			-1.17	238.86
54 69	0.30			-0.03			-0.109		-3.11		296.28	248.91			-0.84	250.45
55 70	0.27			-0.03			-0.117		-2.93		291.75	261.51			-1.05	263.39
56 71	0.27			-0.03			-0.117		-2.27		288.10	273.23			-0.63	275.37
57 72 58 73	-0.06 0.06	0.00	0.12 0.12	0.08			-0.134	-0.063 -0.081	-1.99		285.83	283.57 294.42			-0.92 -0.82	288.52 300.45
		0.00	0.12	0.00	0.076	0.000	0.132	0.001	1.03	3.73	203.03	274.42			0.02	300.43
Z=16																
8 24	0.00			-0.03			-0.140		-2.78		127.26	53.93			-0.73	52.14
9 25 10 26	0.10	0.00	-0.10 0.10	-0.03		0.000	0.131 -0.110	0.049	-0.69 0.17		146.91 171.62	42.36 25.72			1.38 1.15	40.81 24.44
11 27	0.11		0.10	0.03			-0.103		0.42		188.21	17.20			2.83	16.19
12 28	0.28		0.12	0.03	0.321	0.000	-0.103	-0.063	0.23		209.21	4.27	4.07	0.160	2.87	3.58
13 29	0.21	0.00	0.07	-0.03	0.231	0.000	-0.069	0.014	1.25	3.16	224.15	-2.60	-3.16	0.050	3.14	-3.15
14 30				-0.03	-0.256		0.026	0.025	0.60			-13.16		0.003		-13.48
15 31	0.19			-0.04			-0.073	0.025	1.23			-17.32		0.002		-17.46
16 32 17 33	0.20 -0.20			-0.04	-0.221 -0.209		-0.095	0.020 0.056	0.97 1.41			-25.07 -25.22		0.000 0.000		-25.03 -25.08
	-0.23 -0.09		0.10 0.03		-0.235 -0.093			-0.010 -0.035	0.91 1.88			-28.93 -27.98		0.000 0.000		-28.68 -27.70
20 36	0.00		0.00			0.000	0.000	0.030	1.27			-30.13		0.000		-29.82
	-0.06		0.00		-0.063		0.001	-0.029	2.10	3.31	313.37	-27.25	-26.90	0.000		-26.93
22 38	0.11	0.00	0.01	0.02	0.118	0.000	-0.006	-0.021	1.81	3.31	321.79	-27.60	-26.86	0.007	3.32	-27.29
23 39	0.18		0.00			0.000	0.013	0.011	1.58			-23.60		0.050		-23.33
24 40	0.21		0.02	0.00			-0.005	-0.004	0.68			-23.28		0.141		-23.03
25 41	0.23			-0.02			-0.028	0.011	0.07			-18.80		0.118		-18.58
26 42 27 43	0.21 0.18			-0.04 -0.02			-0.058 -0.036	0.026	-0.31 -0.23			-17.49 -12.08		0.124 0.202		-17.22 -11.97
	-0.24				-0.247			-0.055			352.04	-9.42	-9.12	0.395	1.27	-9.08
	-0.24 -0.20		-0.03		-0.247 -0.206			-0.033 -0.045			353.47	-9.42 -2.77	-9.12 -3.25	1.742	1.27	-9.08 -2.65
	-0.20				-0.207				-0.46		357.70	1.07	2.23	1 2	0.92	1.20

N A	$arepsilon_2$	ϵ_3	ϵ_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z = 16	(2)															
	` '	0.00	0.04	-0.05	-0.238	0.000	-0.021	0.054	-0.53	0.75	358.07	8.76			1.18	8.92
					-0.280		-0.034	0.059	-0.68		361.19	13.71			1.48	14.01
					-0.280		-0.045	0.062	-0.84		361.23	21.75			1.38	22.08
34 50	-0.28	0.00	0.07	-0.05	-0.290	0.000	-0.042	0.062	-0.78	0.88	363.43	27.62			1.74	27.98
35 51	-0.27	0.00	0.07	-0.06	-0.280	0.000	-0.044	0.071	-0.36	1.14	362.34	36.78			2.23	37.30
36 52	-0.27	0.00	0.06	-0.06	-0.280	0.000	-0.033	0.068	-0.03	1.23	364.04	43.15			2.31	43.60
37 53					-0.213		-0.096	-0.030	0.49		362.27	52.99			2.49	53.21
	-0.21				-0.213		-0.107		0.50		363.66	59.67			2.46	60.03
39 55 40 56	-0.22 -0.22				-0.223 -0.223		-0.105 -0.094	-0.026 -0.029	0.45 0.58		361.74 362.32	69.67 77.16			2.46 2.48	70.01 77.44
41 57 42 58				-0.05 -0.04	0.367 0.368	0.000	-0.033 -0.043	0.030 0.016	-0.52 -0.72		359.61 359.88	87.94 95.74			2.25 2.01	87.69 95.39
43 59				-0.04 -0.01	0.308	0.000	0.004	0.010	-0.72 -0.37		357.01	106.68			1.59	105.92
44 60		0.00		0.00	0.239	0.000	0.021	0.002	-0.39		356.81	114.95			1.43	114.19
45 61	0.22	0.00	0.00	0.00	0.239	0.000	0.021	0.002	-1.11	0.84	354.07	125.76			0.88	125.01
46 62	0.22	0.00	0.02	0.01	0.240	0.000	-0.002	-0.013	-1.48	0.41	353.72	134.19			0.51	133.53
47 63	0.22	0.00	0.05	-0.01	0.241		-0.041	-0.002		-0.25	350.74	145.24			-0.04	144.74
48 64				-0.01	0.241			-0.002	-2.33		349.82	154.22			-0.29	153.81
49 65				-0.02	0.243		-0.078	0.001	-3.11		346.85	165.26			-0.89	165.33
50 66		0.00		0.00	0.244				-3.01		345.32	174.87			-0.85	175.08
51 67		0.00		0.00	0.259		-0.108	-0.027	-3.52		341.94	186.32			-1.12	187.29
52 68		0.00		0.00	0.261			-0.029	-3.17			196.20			-0.83	197.63
53 69 54 70				-0.01 -0.07	0.260 -0.196	0.000	-0.122 0.008	-0.020 0.066	-3.28 -2.35	-2.74	333.76	208.67 218.72			-1.11 -0.98	210.15 220.69
55 71					-0.197		-0.003	0.078		-3.95		230.66			-1.23	233.54
					-0.197		-0.014	0.080	-2.05	-3.86		241.31			-0.89	244.60
					-0.197		-0.014	0.080	-2.00		322.55	254.14			-1.20	257.67
					-0.316	0.000	0.034	0.070	-1.96	-2.87		266.32			-0.10	269.79
59 75	-0.25	0.00	0.02	-0.08	-0.257	0.000	0.009	0.076	-1.78	-3.99	314.20	278.64			-0.99	282.54
60 76	-0.26	0.00	0.04	-0.08	-0.269	0.000	-0.012	0.081	-1.38	-3.64	310.84	290.06			-0.15	294.69
Z = 17	(CI)															
	-0.05	0.13	0.02	0.00	-0.045	-0.172	-0.015	0.011	-2.98	-2.04	120.64	67.84			-1.72	65.30
9 26		0.00		0.03	0.119			-0.032	-0.88	0.99	141.61	54.94			1.05	52.63
10 27		0.00		0.03	0.126		-0.110		-0.16		166.81	37.82			1.19	36.16
11 28		0.00		0.03	0.120		-0.041		1.39		185.82	26.88			2.29	25.40
					-0.240		-0.110	0.058	0.82		207.13	13.64			2.67	12.63
					-0.240		-0.077	0.049	1.04		223.97	4.87	7.07	0.050	2.92	4.03
					-0.249 -0.219		-0.041 -0.058	0.050 0.052	0.42 1.02		242.96	-6.05 -12.07	-7.07	0.050 0.007	2.48	-6.64 -12.47
	-0.21 -0.23				-0.219 -0.235		-0.038 -0.102		0.84			-12.07 -19.91		0.007		-12.47 -20.10
	-0.23				-0.234		-0.113		1.03			-22.81		0.000		-23.77
	-0.23			0.04	-0.234		-0.113		0.80			-27.97		0.000		-27.88
	-0.11				-0.114		-0.042		1.90			-28.47		0.000		-28.31
20 37	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	1.42	3.13	316.45	-31.11	-31.76	0.000	3.12	-30.88
	-0.07			0.01	-0.073	0.000		-0.010	2.14			-29.85		0.000		-29.58
22 39	0.07	0.00	0.00	0.01	0.075	0.000	0.002	-0.010	2.13	3.44	332.19	-30.71	-29.80	0.002	3.43	-30.42
23 40		0.00		0.00	0.150	0.000	0.008	0.001	2.17			-27.78		0.032		-27.50
24 41		0.00		0.00	0.195	0.000	0.002	-0.001	1.39			-28.30		0.069		-28.03
25 42				-0.01	0.207		-0.022	0.004	0.95			-25.08		0.144		-24.84
26 43 27 44	-0.17			-0.02	0.185 -0.175		-0.038 -0.025	0.013 -0.041	0.54 0.20			-23.97 -19.73		0.157 0.108		-23.73 -19.47
	-0.15 -0.17				-0.155 -0.176		-0.016 -0.024		-0.35 -0.41			-17.86 -12.56		0.124 0.717		-17.68 -12.47
	-0.17 -0.20				-0.176 -0.206		-0.024 -0.042		-0.41 -0.32		374.78	-8.73	17./1	0.717	1.16	-8.61
					-0.239		-0.032	0.056	-0.37		376.45	-2.33			1.51	-2.07
					-0.239	0.000	-0.043	0.059	-0.14		379.80	2.40			1.74	2.71
33 50	-0.27	0.00	0.08	-0.05	-0.280	0.000	-0.056	0.065	-0.68	1.19	380.87	9.39			1.89	9.83

N A	ϵ_2	€ 3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z – 1	17 (Cl)															
	1 -0.27	0.00	0.08	-0.06	-0.281	0.000	-0.055	0.074	-0.62	1.26	383.48	14.85			2.24	15.49
	2 - 0.27				-0.281			0.074	-0.25		383.68	22.73			2.42	23.35
	3 - 0.23		0.09		-0.237			0.005	0.41		384.86	29.62			2.64	29.58
	4 - 0.21		0.10		-0.213			-0.030	0.56		384.79	37.76			2.77	38.02
	5 - 0.21		0.11		-0.213				0.49		386.39	44.23			2.70	44.61
	6 -0.21 $7 -0.22$		0.11		-0.213 -0.223				0.46 0.39		385.56 386.49	53.13 60.27			2.70 2.62	53.50 60.67
	8 -0.25		0.11		-0.223 -0.253				0.10		385.29	69.55			2.52	70.01
42 5	9 - 0.27	0.00	0.12		-0.274				-0.26	0.94	385.99	76.92			2.12	77.40
43 6	0 - 0.27	0.00	0.12	0.06	-0.274	0.000	-0.106	-0.017	-0.54	0.61	384.45	86.53			1.82	87.03
44 6			-0.02	0.00		0.000	0.037	0.005	0.16		383.52	95.53			1.41	94.91
45 6: 46 6:			-0.02 0.00	0.01		0.000 0.000		-0.005 -0.009	-0.45 -0.83		381.31 381.23	105.81 113.97			1.30 0.68	105.20 113.34
47 6			0.00	0.01			-0.013		-0.83 -1.54		379.59	123.67			-0.31	123.17
48 6				-0.01			-0.037	0.003	-1.76		378.81	132.52			-0.60	132.08
49 6	6 0.18	0.00	0.05	-0.01	0.197	0.000	-0.047	0.000	-2.29	-1.32	376.29	143.12			-1.10	142.80
50 6					-0.125		0.017	-0.011	-2.25		374.72	152.76			-1.14	152.35
	8 - 0.18				-0.186		0.023	-0.022	-2.79		371.52	164.03			-1.24	163.84
	9 -0.12 0 -0.18				-0.125 -0.187		0.017 0.002	-0.002 0.020	-2.51 -2.85		369.69 366.08	173.93 185.61			-1.40 -1.42	173.65 185.57
	1 -0.19				-0.197			0.059	-2.60		364.94	194.83			-1.14	196.17
	2 - 0.19				-0.197			0.080		-3.99		205.54			-1.34	208.24
56 7	3 - 0.19	0.00	0.04	-0.08	-0.198	0.000	-0.026	0.082	-2.31	-3.89	359.76	216.14			-0.97	219.25
	4 -0.19				-0.198			0.082	-2.26		355.71	228.27			-1.19	231.60
	5 -0.21				-0.218			0.082		-3.70		239.53			-0.61	243.14
	6 -0.26 $7 -0.26$				-0.269			0.081	-2.12 -1.63	-3.62		252.27 263.65			-0.47	256.12 267.81
	8 -0.26				-0.269 -0.269			0.081	-1.03 -1.54		344.54 339.97	276.30			-0.05 -0.01	280.95
	9 - 0.26				-0.270			0.065	-1.06			288.87			0.24	292.73
Z = 1	18 (Ar)															
9 2		0.00	0.00	-0.03	0.118	0.000	0.004	0.030	-0.88	0.93	137.69	66.15			1.01	63.42
10 2			0.03	0.03			-0.029	-0.033	-0.29		164.61	47.31			1.20	45.06
	9 -0.27 0 -0.27				-0.280 -0.280			0.058 0.058	0.38 0.20		184.38 207.99	35.61 20.07			2.42 2.24	33.97 18.77
	0 - 0.27 $1 - 0.27$				-0.280 -0.281			0.058	0.20		225.49	10.64			2.35	9.56
	2 - 0.27				-0.281			0.063	-0.25		246.12	-1.91	-2.20	0.002	2.12	-2.69
	3 - 0.20				-0.209			0.056	0.62	2.47	260.75	-8.48	-9.38	0.000	2.49	-9.08
	4 - 0.22				-0.230			0.066	0.42			-17.91		0.000		-18.25
	5 -0.23 6 -0.25		0.12		-0.234 -0.255				0.57 0.21			-22.11 -29.57		0.001		-22.34 -29.62
	7 - 0.07		0.12		-0.233 -0.073				1.50			-29.37 -31.06		0.000		-23.02 -31.01
20 3			0.02	0.03		0.000	-0.022	-0.027 0.000	0.78			-31.00 -35.14		0.000		-31.01 -35.00
	9 - 0.04		0.00		-0.042			-0.019	1.63	3.01	335.08	-34.38	-33.24	0.005		-34.17
	0 -0.03		0.00		-0.031			-0.039	1.60			-36.90		0.000		-36.63
23 4			0.00	0.02	0.075			-0.020	2.10			-34.54		0.000		-34.27
24 4: 25 4:	$\begin{array}{ccc} 2 & -0.03 \\ 3 & 0.11 \end{array}$		0.00	0.02	-0.032		-0.000 -0.007	-0.020	1.88 1.43			-36.31 -32.85		0.006 0.005		-36.03 -32.57
	4 -0.14		0.01		-0.118				0.56			-32.85 -33.35		0.003		-32.37 -33.01
	5 -0.15		0.04		-0.154				-0.06			-29.85		0.001		-29.52
28 4	6 -0.13	0.00	0.02	0.03	-0.135	0.000	-0.017	-0.025	-0.67	0.71	386.25	-29.05	-29.72	0.041	0.76	-28.83
	7 - 0.14		0.03					-0.014				-23.80	-25.91	0.100		-23.64
	8 - 0.20		0.06					-0.032			394.33					-20.70
	9 -0.21 0 -0.23				-0.220 -0.240				-0.58 -0.39		396.32 400.72					-14.41 -10.77
	0 - 0.23 $1 - 0.27$				-0.240 -0.281				-0.94		402.17	-4.61			2.26	-3.87
	2 -0.27				-0.281				-0.87		406.06	-0.43			2.38	0.37
	3 - 0.27				-0.280				-0.42		405.99	7.71			2.62	8.06

N A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z = 1	18 (Ar)															
	4 -0.27	0.00	0.11	0.03	-0.276	0.000	-0.094	0.005	-0.25	2.16	408.99	12.78			2.72	13.02
	5 -0.21		0.11		-0.213		-0.107		0.28		408.99	20.85			2.86	21.27
	6 - 0.21		0.12		-0.212				0.15		411.68	26.23			2.82	26.78
	7 -0.21		0.11		-0.213		-0.107		0.18		411.02	34.97			2.73	35.41
	8 - 0.22		0.12		-0.222		-0.116		-0.03		413.11	40.95			2.66	41.52
	9 - 0.25		0.12		-0.253			-0.019			411.94	50.19			2.58	50.71
42 60 43 61			0.12 0.12		-0.253 -0.273	0.000 0.000		-0.019 -0.026	-0.40 -0.79		413.57 412.44	56.63 65.83			2.32 1.86	57.20 66.53
44 62			-0.02	0.00	0.128	0.000	0.030	0.003	0.35		412.21	74.13			1.64	73.60
45 63	0.16	0.00	-0.02	0.01	0.172	0.000	0.036	-0.005	-0.38	1.04	410.56	83.85			1.13	83.34
46 64	4 0.16	0.00	0.00	0.01	0.172	0.000	0.012	-0.009	-0.80	0.70	411.19	91.29			0.75	90.75
47 65		0.00	0.02	0.00	0.173	0.000		-0.003	-1.54		409.30	101.25			0.02	100.72
48 66			0.02		-0.125	0.000		-0.016			409.70	108.93			-0.43	108.52
	7 - 0.12 8 - 0.01		0.02		-0.125 -0.011	0.000 0.000	-0.018 0.000	-0.016	-2.46 -2.53	-1.37 -1.87		119.19 127.33			-1.23 -1.87	118.83 126.88
	9 - 0.12		0.02		-0.125	0.000	-0.017	0.012	-3.37	-2.19		138.44			-2.10	138.13
	0 - 0.12		0.02		-0.125		-0.017 -0.029	0.012		-2.19 -2.04		147.60			-2.10 -1.93	147.39
	1 - 0.16			-0.03	-0.167	0.000	-0.034		-3.32			159.07			-1.77	159.40
	2 - 0.12				-0.125		-0.016	0.022		-1.93		168.83			-1.72	168.91
	3 - 0.16			-0.06	-0.168	0.000	-0.044	0.065		-3.31		179.52			-1.54	181.27
56 74		0.00	0.01	0.06	0.001	0.000	-0.011			-2.51		190.02			-1.21	191.42
57 75 58 76		0.00	0.00	0.08	0.012 0.012	0.000 0.000	0.001 0.001	-0.078 -0.078	-2.13 -1.64	-3.38 -2.99	389.76	201.51 211.91			-1.03 -0.55	204.09 214.72
59 77			0.05	-0.08	-0.269	0.000	-0.001	0.083	-2.29		383.46	223.95			-0.33 -0.34	227.71
60 78			0.06		-0.270		-0.034	0.077		-2.88		234.93			0.05	238.56
61 79	9 -0.26	0.00	0.08	-0.05	-0.270	0.000	-0.058	0.065	-1.77	-2.31	375.18	248.37			0.05	251.62
	-0.26		0.09	-0.03	-0.270	0.000	-0.070	0.051	-1.35	-1.50	371.88	259.74			0.31	262.64
	1 - 0.25		0.12		-0.258		-0.107	0.033	-1.48	-1.48		272.88			0.45	276.10
	$\begin{array}{ccc} 2 & -0.25 \\ 3 & -0.26 \end{array}$		0.12		-0.258 -0.269		-0.107 -0.083	0.033	-1.18 -1.19	-1.27		283.89 297.57			0.71 0.60	287.40 300.86
05 6.	5 -0.20	0.00	0.10	-0.01	-0.209	0.000	-0.063	0.030	-1.19	-0.92	336.20	291.31			0.00	300.80
	19 (K)															
10 29 11 30		0.00	-0.01 0.01	0.03	0.075 0.108	0.000	0.015 -0.006	-0.029	-0.84 0.38		158.29 179.85	60.91 47.43			0.92 1.99	58.25 45.18
12 31		0.00	0.01	0.03	0.108		-0.008		0.36		203.79	31.56			2.00	29.74
13 32		0.00	0.01	0.04	0.086		-0.008		0.70		222.81	20.61			2.47	19.13
14 33	3 0.00	0.00	0.02	0.04	0.001	0.000	-0.023	-0.039	0.25	1.72	244.38	7.10			1.74	5.95
15 34	4 0.02	0.00	-0.02	0.04	0.021	0.000		-0.039	0.88	2.45	260.47	-0.91			2.46	-1.79
	5 - 0.03				-0.031	-0.027	0.001	0.040	1.28			-11.01		0.020		-11.65
	6 -0.03 7 -0.06		0.01		-0.032 -0.062		-0.011 -0.022	0.040 -0.037	1.66			-17.07 -25.06		0.008 0.000		-17.51
	7 -0.00 8 -0.04		0.02		-0.002 -0.042		-0.022 -0.011	0.001	1.42 1.17			-23.00 -28.41		0.000		-25.31 -29.31
	9 - 0.03		0.00		-0.032	0.000		-0.010	0.40			-33.93		0.000		-33.92
	0.05 -0.05		0.00		-0.052	0.000		-0.010	1.18			-34.55		0.000		-34.44
	1 - 0.03		0.00		-0.032	0.000	0.000	-0.010	1.03			-37.48		0.000		-37.30
	2 - 0.05		0.01		-0.053	0.000	-0.011	0.001	1.69			-36.80		0.000		-36.58
	3 - 0.05		0.00		-0.052	0.000		-0.010	1.32			-38.49		0.009		-38.23
	4 - 0.06		0.00		-0.063	0.000	0.001	0.000	1.21			-37.01		0.036		-36.74
26 45 27 46	5 -0.05 $6 0.06$		0.00	0.00	-0.052 0.064	0.000 0.000	0.001 -0.010	0.000 -0.001	0.53 -0.02			-37.79 -35.22		0.010 0.016		-37.53 -34.97
	7 -0.04		0.00		-0.042	0.000	0.001	0.000	-0.02 -0.84			-35.22 -35.07		0.018		-34.85
	8 - 0.05		0.00		-0.052	0.000	0.001		-0.59			-31.15		0.024		-30.97
30 49	9 -0.05	0.00	0.01	0.00	-0.053	0.000	-0.011	0.001	0.05	1.09	409.09	-28.46	-30.32	0.070	1.09	-28.31
	0 - 0.05		0.00		-0.052	0.000	0.001	-0.010	0.68			-23.15	-25.35	0.278		-23.04
	1 - 0.08				-0.084		-0.009	0.010	1.25		416.29					-19.46
	$ \begin{array}{rrr} 2 & -0.13 \\ 3 & -0.29 \end{array} $				-0.136 -0.301		-0.015 -0.061	0.031	1.37 -0.26		418.43 422.67	-13.58 -9.76				-13.49 -8.00
								0.078							3.22	-8.99
35 54	4 -0.16	0.00	0.04	-0.02	-0.167	0.000	-0.034	0.025	1.56	3.04	423.74	-2.75			3.17	-2.74

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 19	(K)															
		-0.14	0.00	0.05	0.02	-0.145	0.000	-0.050	-0.010	1.67	3.08	427.06	2.00			3.22	1.96
		-0.13		0.06	0.03	-0.134	0.000	-0.062	-0.018	1.64	3.05	428.12	9.01			3.27	9.01
		-0.13		0.07		-0.132	0.000	-0.074		1.37		431.39	13.81			3.02	14.11
		-0.07 -0.02		0.03		-0.073 -0.021	0.000 0.000	-0.033 0.000	-0.016 0.000	1.87 1.56		431.38 433.48	21.90			2.93 2.76	21.66 27.49
													27.86				
41 42		-0.07 -0.03		0.00 0.00		-0.071 -0.032	-0.092 0.000	0.004	0.003	1.16 1.17		433.54 435.20	35.88 42.29			2.65 2.29	35.60 41.84
	62	-0.03 -0.08		0.00	0.00	-0.032 -0.083	-0.065	-0.019	0.003	0.81		434.77	50.78			2.09	50.42
		-0.09		0.00		-0.094	0.000	0.003	-0.000	0.53		435.97	57.66			1.72	57.18
45	64	0.12	0.00	-0.02	0.00	0.128	0.000	0.030	0.003	-0.16	1.35	435.11	66.59			1.40	66.15
46	65	0.12	0.00	0.00	0.01	0.129	0.000	0.007	-0.010	-0.64	0.84	436.03	73.74			0.87	73.28
	66	0.12		0.01	0.00	0.129	0.000		-0.001	-1.41		435.09	82.75			0.12	82.28
	67	-0.10		0.01	0.01	-0.105	0.000	-0.008	-0.009	-1.89	-0.67		90.08			-0.64	89.65
	68 69		0.00	0.00	0.00	-0.094 0.000	0.000		-0.000 -0.010	-2.75 -3.29	-1.53 -2.23		99.39 107.23			-1.52 -2.20	98.95 106.84
		-0.10				-0.105	0.000		-0.000				117.61				117.25
51 52		-0.10 -0.10		0.00 0.00		-0.105 -0.105	0.000	0.004	-0.000 -0.000	-3.65 -3.36	-2.39 -2.15		126.79			-2.39 -2.14	126.49
		-0.10		0.00		-0.105	0.000	-0.007	0.011	-3.39	-2.26		137.58			-2.22	137.39
		-0.10		0.01		-0.105	0.000	-0.007	0.011	-2.92	-1.84		147.30			-1.79	147.18
55	74	-0.10	0.00	0.02	-0.01	-0.105	0.000	-0.019	0.012	-2.89	-1.89	423.91	158.50			-1.80	158.51
56			0.00	0.01	0.04	0.022	0.000		-0.039	-2.24		422.26	168.22			-1.25	168.80
57			0.00	0.00	0.08	0.001	0.000		-0.078	-2.33		420.28	178.27			-1.13	180.59
58			0.00	0.00	0.08	0.001	0.000		-0.078	-1.80		417.98	188.64			-0.63	191.17
59 60			0.00	-0.02 0.01	0.08 0.08	0.043 0.023	0.000 0.000	0.026 -0.010	-0.078 -0.078	-1.49 -0.93		414.00 411.34	200.70 211.43			-0.30 0.21	203.49 214.39
61			0.00	0.00	0.08	0.065	0.000	0.004	-0.079	-0.77		407.12	223.72			0.45	226.91
62		-0.06		0.00	0.08	-0.062	0.000	0.004	-0.079 -0.077	-0.77 -0.35		404.67	234.24			0.43	237.64
	82	0.05			-0.02	0.054	0.000	-0.047	0.018	-0.09		397.93	249.05			0.78	250.51
	83	0.05	0.00	0.04	-0.02	0.054	0.000	-0.047	0.018	0.14	0.62	394.99	260.07			1.01	261.73
65	84	0.05	0.00	0.04	-0.02	0.054	0.000	-0.047	0.018	-0.03	0.49	390.58	272.55			0.88	274.43
66			0.00		-0.01	0.054	0.000	-0.035	0.008	0.07		387.29	283.91			0.99	285.79
	86		0.00	0.03	-0.02	0.053	0.000	-0.035	0.018	-0.31		382.96	296.31			0.68	298.56
68	87	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.41	0.74	379.41	307.93			0.74	310.13
Z :	= 20	(Ca)															
10		0.00		0.00	-0.03	0.000	0.000	0.000	0.030	-1.16		154.64	71.85			0.77	68.82
11		0.00		0.00	0.04	0.000	0.000		-0.039	0.08		176.70	57.87			1.81	55.32
12 13		0.00	0.00	0.00	0.04	0.000	0.000 0.000		-0.039 -0.040	-0.03 0.09		202.61 222.19	40.03 28.51			1.59 1.94	37.89 26.74
14			0.00		0.04	0.000	0.000		-0.040 -0.039	-0.55		245.36	13.41			1.35	11.98
15		0.00		0.00	0.04	0.000	0.000		-0.039	0.10		262.07	4.78			1.88	3.63
16		0.00		0.00	0.04	0.000	0.000		-0.039	0.10		281.63	-6.71	-6.44	0.040	2.20	-7.59
17	37	-0.02		0.00	0.04	-0.021	0.000	0.000	-0.039	0.93			-13.14		0.022		-13.78
18		0.00		0.00	0.04	0.000	0.000		-0.039	0.63			-22.66		0.005		-23.10
19	39	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.33	2.57	326.55	-27.42	-27.27	0.002	2.56	-27.69
20		0.00		0.00	0.01	0.000	0.000		-0.010	-0.52			-35.42		0.000		-35.55
21		-0.02			0.02		0.000		-0.020	0.38			-36.34		0.000		-36.35
22 23		0.00	0.00	0.00	0.01	0.000	0.000 0.000		-0.010 -0.020	0.08 0.75			-40.89 -40.56		0.000 0.000		-40.81 -40.40
24		0.00		0.00	0.02	0.000	0.000		-0.020	0.73			-43.79		0.000		-43.58
25		-0.01		0.00	0.00	-0.011	0.000	0.000	0.000	0.28			-42.65		0.000		-42.40
26		0.00		0.00	0.00	0.000	0.000	0.000	-0.010	-0.57			-44.86		0.002		-44.60
27		0.03		0.01	0.00	0.032	0.000	-0.012		-0.98			-42.67		0.002		-42.40
28			0.00	0.00	0.00	0.000	0.000	0.000		-1.94			-43.71		0.004		-43.45
29	49	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.54	0.16	419.77	-39.92	-41.29	0.004	0.15	-39.68
30		0.00		0.00	0.00	0.000	0.000	0.000		-0.88			-38.53		0.009		-38.32
31			0.00	0.00	0.00	0.000	0.000	0.000		-0.09			-33.36		0.094		-33.19
32	52	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.56	1.82	435.06	-31.00	-32.51	0.699	1.82	-30.86

N A	ϵ_2	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z = 20) (Ca)															
33 53	` ′	0.00	0.00	0.00	0.064	0.000	0.002	0.000	1.32	2.67	436.95	-24.82			2.67	-24.72
34 54			0.00	0.00	-0.011	0.000	0.000	0.000	1.72		442.33				2.59	-22.08
	-0.07		0.01		-0.073		-0.009	0.001	1.93		443.99					-15.70
	-0.07 -0.07		0.02	0.02	-0.073	-0.026 -0.039	-0.021 -0.009	-0.017 0.001	1.92 1.93		448.48 449.51	-12.13 -5.09			2.96 3.11	-12.12 -5.18
			0.01													
38 58 39 59	0.00		0.00 0.00	0.00		-0.054 -0.067	0.001 0.001	0.001 0.002	1.50 1.13		453.45 454.18	-0.96 6.38			2.95 2.82	-1.09 6.23
40 60		0.03	0.00	0.00		-0.094	0.001	0.002	0.33		457.88	10.75			2.28	10.62
41 61	-0.02	0.09	0.00	0.00	-0.018	-0.121	0.004	0.005	0.23		457.93	18.77			2.29	18.69
42 62	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.33	1.78	460.70	24.07			1.78	23.75
43 63		0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.32		460.33	32.51			1.58	32.16
44 64 45 65		0.00 0.00	0.00 0.00	0.00	0.000 0.000	0.000 0.000	0.000	0.000 0.000	-0.05 -0.41		462.71 462.16	38.21 46.83			1.11 0.58	37.83 46.44
46 66		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.41 -0.96		464.11	52.95			-0.00	52.54
47 67		0.00		0.01	0.021	0.000	0.012	-0.010	-1.75		463.42	61.71			-0.83	61.33
48 68	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.62	-1.49	464.95	68.26			-1.50	67.86
49 69		0.00	0.01	0.00	0.021	0.000		-0.000	-3.58	-2.35		77.45			-2.35	77.07
50 70		0.00	0.00	0.00	0.000	0.000	0.000	0.000 -0.010	-4.43	-3.02		84.42			-3.02	84.06
51 71 52 72	-0.02	0.00	0.00	0.01	-0.021 0.000	0.000 0.000	0.000 0.000	-0.010 -0.010	-4.34 -4.09	-3.11 -2.88	462.64 462.42	94.78 103.07			-3.09 -2.85	94.47 102.81
53 73		0.00	0.00	0.00	0.000	0.000	0.000			-2.75		114.02			-2.75	113.78
54 74		0.00	0.00	0.00	0.000	0.000	0.000			-2.27		122.95			-2.27	122.78
55 75		0.00	0.00	0.01	0.011	0.000	0.000	-0.010		-2.18	455.49	134.21			-2.15	134.14
56 76		0.00	0.00	0.03	0.000	0.000	0.000		-2.84		454.50	143.27			-1.65	143.54
57 77		0.00	0.00	0.08	0.001	0.000			-2.88	-3.51		153.18			-1.47	155.31
58 78 59 79		0.00 0.00	0.00	0.06	0.001	0.000 0.000		-0.058 -0.078	-2.20 -1.88		450.20 447.07	163.71 174.92			-0.93 -0.54	165.10 177.40
60 80		0.00	0.00	0.08	0.012	0.000		-0.078	-1.36		445.29	184.77			-0.09	187.46
61 81		0.00	0.00	0.09	0.044	0.000		-0.088	-1.10		441.64	196.49			0.23	200.00
62 82	0.05	0.00	0.00	0.04	0.054	0.000	0.002	-0.039	-0.49	0.00	437.23	208.97			0.62	210.31
63 83		0.00	0.03	-0.01	0.054	0.000	-0.035	0.008	-0.38		432.47	221.80			0.65	222.85
64 84 65 85		0.00 0.00	0.02	0.00 -0.01	0.054 0.054	0.000	-0.023 -0.035		-0.16 -0.33		430.17 425.90	232.17 244.51			0.86 0.73	233.29 245.93
66 86		0.00		-0.01	0.043		-0.023		-0.27		423.52					256.51
67 87		0.00	0.00	0.00	0.000	0.000	0.000		-0.61		418.88					269.33
68 88	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.88	0.38	416.58	278.05			0.38	279.93
	-0.02		0.01	0.01		0.000		-0.009				290.66			0.01	292.84
70 90	-0.00	0.00	0.00	0.00	0.000 -0.021	0.000 0.000	0.000	-0.000 -0.010	-1.62			301.25			-0.26 -0.42	303.62 316.96
72 92		0.00		0.00	0.000	0.000	0.012				401.68					328.14
Z = 2	1 (S a)															
$z = z_1$ 11 32		0.00	-0.07	0.04	0.440	0.000	0.167	0.013	-1.67	2.09	169.89	71.97			2.20	69.07
12 33			-0.07		0.122	0.000	0.093	0.054	0.06		197.22	52.70			1.20	50.47
13 34	0.11	0.00	-0.06	-0.04	0.121	0.000	0.079	0.052	0.25	1.71	218.02	39.97			1.90	38.00
14 35			-0.05		0.088	0.000	0.064	0.047	0.03		241.12	24.95			1.75	23.28
15 36			-0.02		0.086	0.000	0.026	0.043	0.76		259.35	14.79			2.33	13.37
16 37 17 38	-0.08		-0.01 0.00		0.086 -0.063	0.000 0.000	0.014	0.041 -0.039	1.26 1.73		279.25 295.55	2.96 -5.27			2.72 2.91	1.83 -6.15
	-0.06				-0.063	0.000		-0.039 -0.039	1.73			-3.27 -15.19	-14.17	0.024		-0.13 -15.84
	-0.04				-0.042	0.000		-0.030	1.23			-21.38		0.003		-21.85
20 41	-0.02	0.00	-0.01	0.03	-0.021	0.000	0.012	-0.030	0.49	2.58	344.09	-29.59	-28.64	0.000	2.57	-29.88
	-0.06				-0.063	0.000		-0.030	1.18			-32.81		0.000		-33.68
22 43 23 44	-0.04		-0.02 -0.02	0.02	-0.042 0.053	0.000 0.000	0.024 0.025	-0.020 0.001	0.96 1.44			-38.44 -39.73		0.002 0.002		-38.47 -39.67
24 45			-0.02 -0.01		0.033	0.000	0.023	0.001	1.44			-39.73 -43.43		0.002		-39.07 -43.28
	-0.05				-0.052	0.000		-0.010	0.97			-43.39		0.001		-43.19
26 47	-0.02	0.00	-0.01	0.00	-0.021	0.000	0.012	-0.000	0.14	1.45	408.97	-46.04	-44.33	0.002	1.44	-45.81

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 21	(Sc)															
27		` '	0.00	-0.01	-0.01	0.064	0.000	0.013	0.011	-0.32	1.20	416.14	-45.15	-44.50	0.005	1.20	-44.89
28		-0.03				-0.032	0.000		-0.000				-46.42		0.004		-46.15
		-0.04 -0.04				-0.042 -0.042	0.000 0.000		-0.001 -0.001	-0.62 -0.03			-43.86 -42.77		0.016 0.020		-43.59 -42.51
		-0.04 -0.04				-0.042 -0.042	0.000		-0.001	-0.03 0.79			-42.77 -38.81		0.020		-42.51 -38.58
32				-0.02		0.064	0.000	0.025	0.012	1.41		447.86					-36.28
33		0.10			-0.01	0.107	0.000	0.004	0.010	1.92			-31.45	-34.22	0.370		-31.27
						-0.104	0.000	0.016	0.018	2.25			-28.96	-29.58	0.736		-28.80
		-0.10 -0.10		0.00		-0.104 -0.105	0.000 0.000	0.004 -0.008	0.009 0.001	2.58 2.57		459.19	-23.63 -20.24				-23.53 -20.19
		-0.10		0.02		-0.105	0.000	-0.019		2.62			-14.42				-14.39
		-0.10 -0.07		0.02		-0.103 -0.073	-0.039	-0.019	-0.007 -0.008	2.43		470.43					-14.39 -10.67
		-0.04		0.00		-0.040		0.002	0.002	2.05		472.19	-4.34			3.57	-4.37
		-0.02		0.00		-0.018		0.003	0.004	1.34		475.94	-0.02			3.17	-0.02
41		-0.04				-0.038		0.016	0.005	1.19		477.02	6.97			3.15	6.98
42 43		-0.02		-0.01 -0.02	0.00	-0.021 0.053	0.000 0.000	0.012 0.025	-0.000 0.001	1.43 1.25		480.02 480.80	12.04 19.34			2.61 2.29	11.83 19.12
43				-0.02 -0.04		0.033	0.000	0.023	0.001	0.37		483.12	25.08			2.29	24.98
45				-0.03	0.00	0.128	0.000	0.043	0.005	-0.24		483.55	32.73			1.53	32.52
46	67	0.12	0.00	-0.02	0.00	0.128	0.000	0.030	0.003	-0.75	0.90	485.61	38.74			0.95	38.48
47				-0.01	0.00	0.128	0.000	0.018	0.002	-1.53		485.77	46.65			0.15	46.35
	69	-0.04		0.00	0.00	-0.042	0.000	0.001		-1.81		487.64	52.86			-0.72	52.53
49 50		0.05 -0.03		0.00 -0.01	-0.01	0.053 -0.032	0.000 0.000	0.001		-2.85 -3.68	-1.80 -2.42	487.64 488.81	60.92 67.83			-1.78 -2.41	60.62 67.53
51		-0.07				-0.073	0.000			-3.70	-2.45		77.38			-2.33	77.21
52	73	-0.03	0.00	0.00	0.01	-0.032	0.000	0.000	-0.010	-3.20	-2.17	487.17	85.60			-2.15	85.37
		-0.04		0.00	0.01	-0.042	0.000	0.001	-0.010	-2.99	-1.98	485.07	95.77			-1.95	95.58
		-0.04				-0.042	0.000		-0.010		-1.50		104.61			-1.46	104.48
		-0.04 -0.03				-0.042 -0.032	0.000 0.000		-0.010 -0.010		-1.28 -0.83		115.17 124.36			-1.24 -0.75	115.10 124.39
57		-0.03				-0.032	0.000		-0.049	-1.55	-1.28		134.60			-0.51	135.40
	79			-0.03		0.024	0.000	0.038	0.062	-1.07		477.43	143.77			0.12	145.21
59				-0.06	0.03	0.063	0.000		-0.025				155.71			0.41	156.61
60				-0.06			0.000		-0.035								166.60
		-0.06				-0.063	0.000		-0.032	0.07			177.08				178.09
		-0.06		-0.03 -0.03		-0.062 -0.062	0.000 0.000	0.037	-0.002 0.018	0.49 0.59		465.96 462.44	187.53 199.12			1.22 1.35	188.24 200.11
		-0.06		0.00		-0.062	0.000	0.001	0.000	0.81		460.15	209.48			1.42	210.36
		-0.06		0.01	0.01	-0.063	0.000	-0.010	-0.009	0.67	1.29	456.49	221.21				222.31
		-0.06		0.03		-0.062		-0.034		0.56		454.64	231.13				232.79
		-0.06		0.03		-0.062		-0.033		0.25		450.65	243.19			1.12	244.86
68 69		0.02 -0.04		-0.01 0.01	0.00	0.021 -0.042	0.000 0.000	0.012	0.000 -0.009	0.26 -0.28		447.73 444.11	254.18 265.88			1.33 0.70	255.82 267.76
		-0.04 -0.01				-0.042 -0.010	0.000		-0.009 -0.000			441.37	276.69			0.70	278.76
		-0.03				-0.032	0.000		-0.010			437.26	288.87			0.39	291.27
72	93	-0.02	0.00	-0.01	0.00	-0.021	0.000	0.012	-0.000	-0.91	0.26	434.33	299.87			0.28	302.42
73				-0.03		0.043	0.000	0.037		-1.35			311.94			-0.24	314.95
74	95	0.08	0.00	-0.07	-0.04	0.090	0.000	0.090	0.051	-1.85	-2.27	428.99	321.36			-0.36	326.34
		(Ti)															
12				-0.12			-0.029	0.181		-1.36		194.38	62.83			1.45	61.05
13 14				-0.12 -0.03	-0.04 0.04	0.206	-0.029 0.000	0.170	-0.081 -0.036	-0.70 0.14		215.61 240.07	49.68 33.28			1.88 1.42	47.94 31.29
15				-0.03 -0.02	0.04	0.100	0.000		-0.030 -0.037	0.14		258.64	22.79			2.12	21.11
16			0.00		-0.04	0.118	0.000	0.004	0.041	1.08		280.22	9.28			2.43	7.90
17	39	0.10	0.00	0.00	0.04	0.107	0.000	0.006	-0.040	1.59	3.11	296.39	1.18			3.13	0.06
		-0.03		0.00		-0.031	0.000		-0.039	1.54			-10.72	-8.85	0.160		-11.58
19	41	-0.03	0.00	0.00	0.05	-0.031	0.000	0.000	-0.049	1.27	2.84	330.94	-17.23			2.85	-17.87

N	A	$arepsilon_2$	ε_3	ε_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} ^{FL} (MeV)
	= 22	(Ti)															
	42	` '	0.00	0.00	0.05	0.001	0.000	0.000	-0.049	0.47	2.41	348.74	-26.96	-25.12	0.005	2.42	-27.41
21	43	-0.04	0.00	-0.01	0.05	-0.042	0.000	0.012	-0.049	1.33	3.01		-31.19		0.007		-31.48
	44		0.00	0.00	0.04	0.000	0.000		-0.039	1.10			-38.98		0.001		-39.13
23	45		0.00	0.00	0.04	0.043	0.000		-0.039	1.63			-40.65		0.001		-40.69
	46		0.00	0.00	0.01	0.021	0.000		-0.010	1.20			-45.22		0.001		-45.17
25	47 48		0.00 0.00	-0.01 0.00	0.01	0.053 0.011	0.000	0.013	-0.009 0.000	1.03 0.15			-46.42 -50.14		0.001 0.001		-46.29 -49.96
	49		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-0.13			-30.14 -49.67		0.001		-49.90 -49.44
	50		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.38			-52.24		0.001		-51.98
29	51	0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-0.86	0.47	444.32	-49.89	-49.73	0.001	0.47	-49.62
30	52	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.23	0.90	452.60	-50.10	-49.47	0.007		-49.83
	53		0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.60			-46.43		0.100		-46.16
	54 55	-0.01	0.00	0.00	0.00	-0.011 0.107	0.000	0.000 0.004	0.000 0.000	1.35 1.71			-45.52 -40.59		0.125 0.152		-45.28 -40.35
	56		0.00	0.00		0.107	0.000	-0.004	0.007	1.71			-40.39 -38.86		0.132		-40.33 -38.64
35			0.00	0.03		0.129	0.000	-0.031	0.016	2.23			-33.80		0.455		-33.59
36	58	-0.12		0.03	0.00	-0.125	0.000	-0.031 -0.019	0.010	2.50		482.65		55.54	0.133		-33.59 -31.58
37	59	-0.10	0.00	0.02	0.00	-0.105	0.000	-0.019	0.002	2.58		485.06					-25.96
	60	-0.01		0.00	0.00		0.000	0.000	0.000	2.48		490.44					-23.33
39	61		0.00	0.00	0.00	0.000	0.000	0.000	0.000	2.20		492.36					-17.21
	62		0.00	0.00	0.00	0.000	0.000	0.000	0.000	1.65		497.16					-13.99
	63 64	-0.02	0.00	-0.01 0.00	0.00	-0.021 0.000	0.000 0.000	0.012	-0.000 0.000	1.79 1.21		498.31 502.54	-7.03 -3.19			3.02 2.44	-7.10 -3.30
	65		0.00	0.00	0.00	0.000	0.000	0.000	0.000	1.15		503.35	4.08			2.23	3.93
	66		0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.73		507.01	8.48			1.61	8.31
45	67	0.12	0.00	-0.04	0.00	0.129	0.000	0.055	0.007	-0.48	1.20	507.46	16.10			1.33	16.03
46	68	0.12	0.00	-0.02	0.01	0.128	0.000	0.031	-0.007	-0.94	0.63	510.50	21.13			0.69	20.97
	69			-0.01	0.00	0.128	0.000	0.018	0.002	-1.74		510.79	28.92			-0.11	28.70
48 49	70 71		0.00 0.00	0.00 0.01	0.00	0.000 0.043	0.000	0.000 -0.011	0.000 -0.000	-2.10 -3.21		513.73 513.74	34.05 42.11			-1.13 -2.08	33.80 41.87
51	72 73	-0.03	0.00	0.00 -0.01	0.00 -0.01	0.000 -0.031	0.000 0.000	0.000 0.012	0.000	-4.07 -3.82		515.85 514.42	48.08 57.57			-2.75 -2.68	47.83 57.37
52			0.00	0.00	0.00	0.000	0.000	0.000	0.000		-2.39		64.98			-2.39	64.76
53	75	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.11	-2.12	513.02	75.11			-2.12	74.93
54	76	0.00	0.00	0.00	0.01	0.000	0.000	0.000	-0.010	-2.53	-1.60	513.06	83.15			-1.58	83.02
	77		0.00	0.00	0.01	0.021	0.000		-0.010				93.64			-1.34	93.56
	78		0.00	0.00	0.02	0.000	0.000		-0.020				102.07			-0.74	102.13
	79 80		0.00 0.03	0.00	0.05 0.04	0.001 0.001	0.000 -0.039		-0.049 -0.039			508.01 507.03	112.42 121.47			-0.41 0.15	113.13 122.05
59				-0.02	0.02	0.042	0.000		-0.019			503.52	133.05			0.45	133.38
	82			-0.01	0.04	0.053	0.000		-0.039	0.18		502.77	141.87			0.98	142.64
	83			-0.02	0.04	0.053	0.000		-0.038	0.48		499.38	153.33			1.23	154.25
62				-0.01	0.02	0.053	0.000		-0.019	0.86		497.77	163.01			1.53	163.63
	85		0.00			0.075	0.000	-0.034	0.008	0.92		494.14	174.71			1.67	175.44
	86		0.00	0.02	0.00	0.054		-0.023		1.12		492.72	184.20			1.80	184.99
	87		0.00		-0.01	0.054		-0.035	0.008	0.98		489.16	195.84			1.71	196.86
	88 89		0.00 0.00	0.02	-0.01 0.00	0.053	0.000	-0.023 0.000	0.009	0.96 0.71		487.60 483.59	205.46 217.55			1.70 1.62	206.59 218.75
	90		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.42		482.03	227.18			1.41	228.57
	91	-0.02		0.01	0.00	-0.021	0.000	-0.012		-0.04		478.12				1.07	240.74
70	92	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.35	0.76	476.39	248.96			0.76	250.74
		-0.02			0.01	-0.021	0.000	0.012	-0.010			472.17	261.25			0.55	263.30
	94		0.00	0.00	0.00	0.000	0.000	0.000		-0.82		470.10	271.39			0.28	273.61
	95 96		0.00	0.00	-0.01 0.00	-0.021 0.000	0.000	0.000		-1.19 -1.31		465.79 463.42	283.78 294.21			-0.06 -0.25	286.27 296.91
	90			-0.07		0.000	0.000	0.000									309.39
	97			-0.07 -0.05	-0.02 0.01	0.120	0.000		-0.002	-2.49 -2.53							309.39
	/ 0	0.11	5.50	0.03	0.01	5.110	3.000	3.007	3.302		1.75	.57.20	2 2 0 . 17			1.01	

N	A	$arepsilon_2$	ε_3	ε_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	22	(T/)															
Z = 13		(V)	0.00	-0.10	0.04	0.259	0.000	0.154	-0.004	-1.08	0.64	210.14	62.44			0.93	59.97
14				-0.10 -0.09		0.239		0.134	0.069	-0.75		234.78	45.87			1.47	43.94
15				-0.05		0.197		0.075	0.056	0.08		254.64	34.08			2.15	32.21
16				-0.02			0.000	0.040	0.048	0.44		276.47	20.32			2.52	18.70
17	40	0.17	0.00	-0.01	-0.04	0.184	0.000	0.023	0.044	1.39	2.89	294.46	10.40			2.90	9.04
18		0.11		0.00	0.05		0.000	0.008	-0.049	1.72		313.99	-1.06			3.26	-2.13
19		0.05		0.00	0.05		0.000	0.002	-0.049	1.77		330.39	-9.39				-10.23
20 21		0.01	0.00	0.00 -0.02	0.05 -0.02	0.011	0.000	0.001 0.026	-0.049 0.022	1.03 1.75		348.55 362.45	-19.48 -25.31	_24 12	0.121		-20.11 -25.78
22		0.03		0.00	0.04		0.000	0.001	-0.039	1.60			-33.45		0.017		-33.75
23	46	0.18	0.00	-0.08	0.01	0.195	0.000	0.115	0.012	0.22	3.26	390.07	-36.79	-37.07	0.001	3.24	-37.61
24				-0.07	0.02		0.000	0.104	-0.001	-0.38			-42.92		0.001		-42.95
25				-0.05	0.01		0.000	0.078	0.004	-0.34			-44.88		0.003		-44.84
26				-0.03	0.00		0.000	0.046	0.007	-0.31			-49.04		0.001		-48.92
27				-0.01	0.00		0.000	0.016	0.001	-0.30			-49.94		0.001		-49.76
28 29		0.02 0.05		0.00 0.00	0.00		0.000 0.000	0.000 0.001	0.000 -0.010	-0.90 -0.43			-52.90 -51.82		0.001 0.001		-52.67 -51.56
30				-0.00	0.01		0.000	0.001	-0.010 -0.007	-0.43 -0.06			-51.82 -51.98		0.001		-51.30 -51.70
31				-0.02	0.01		0.000		-0.007	0.74			-49.44		0.015		-49.15
32	55	0.16	0.00	-0.01	0.01	0.172	0.000	0.024	-0.007	0.90	3.05	474.39	-48.46	-49.15	0.100	3.06	-48.17
33	56	0.16	0.00	0.01	0.00	0.173	0.000	-0.001	-0.001	1.50	3.69	479.08	-45.08	-46.08	0.204	3.70	-44.81
34		0.16			-0.02			-0.027	0.015	1.79			-43.78		0.233		-43.49
35		0.13			-0.02			-0.030	0.016	2.47			-39.97		0.248		-39.71
36 37		0.13 -0.13		0.03	-0.02 0.01			-0.030 -0.028	0.016 -0.005	2.68 2.87			-37.93 -33.26		0.307 0.475		-37.69 -33.07
	61			0.03		-0.104			-0.006	2.85		505.08		32.30	0.175		-30.57
	62	0.01		0.03	0.00		0.000	0.000	0.000	2.93		508.15					-30.57 -25.64
	63	0.01		0.00	0.00		0.000	0.000	0.000	2.43		513.12					-22.58
41		-0.03		0.00	0.00	-0.032		0.000	0.000	2.57		515.29					-16.70
42	65	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	2.00	2.97	519.71	-13.07			2.97	-13.10
43				-0.04		0.129		0.055	0.017	1.26		521.56	-6.85			2.83	-6.78
44 45				-0.06 -0.04	-0.01	0.162	0.000	0.084	0.024 -0.001	0.05 -0.55		525.39 526.97	-2.60 3.88			2.38 1.63	-2.40 3.89
46				-0.04	0.01		0.000	0.048	-0.001	-0.33 -1.04		530.20	8.73			1.00	8.68
47		0.12	0.00	-0.01	0.00		0.000	0.018	0.002	-1.38		531.53	15.47			0.05	15.33
48	71	0.12	0.00	0.01	-0.01	0.129	0.000	-0.007	0.009	-1.94	-0.43	534.07	21.00			-0.40	20.86
49		0.05		0.01	0.00			-0.011	-0.001		-1.71		27.84			-1.70	27.67
50		0.01		0.00	0.01		0.000	0.000	-0.010	-3.49	-2.33		33.71			-2.32	33.54
51 52		0.03 -0.01		-0.02 0.01	0.00	-0.032 -0.010	0.000	0.024	0.001	-3.18 -2.78	-2.28 -1.86	536.93	42.35 49.75			-2.25 -1.85	42.20 49.58
		-0.01		0.01		-0.010 -0.010			0.000	-2.78 -2.31		536.32	59.10			-1.63	58.96
		-0.01		0.01		-0.010 -0.010			0.000	-2.31 -1.68		536.41	67.09			-1.51 -0.94	58.96 66.96
		-0.02		0.01		-0.021			0.000	-1.27		534.65	76.92			-0.52	76.83
		-0.01		0.01	0.00			-0.012	0.000	-0.66		534.39	85.25			-0.02	85.20
57	80	0.02	0.00	0.00	0.03	0.021	0.000	0.001	-0.030	-0.26	0.04	532.59	95.12			0.28	95.35
58				-0.01	0.03		0.000	0.026		-0.32		531.59	104.19			1.16	104.50
59 60				-0.07	0.00		0.000	0.121	0.031	-1.90		529.46	114.40			1.66	115.24
60 61				-0.07 -0.06	0.00		0.000 0.000	0.121 0.110	0.031 0.028	-1.63 -1.67		528.79 526.19	123.14 133.80			1.88 1.88	124.10 134.67
62				-0.06	0.00	0.305		0.111	0.018	-1.27		525.12	142.95			2.07	143.87
63				-0.06	0.01		0.000	0.108	0.016	-1.10		522.47	153.67			1.96	154.67
64				-0.05	0.00	0.294		0.095	0.023	-0.68		521.03	163.18			2.19	164.24
65				-0.04		0.295		0.081	0.029	-0.63		518.00	174.28			2.15	175.43
66 67				-0.03			0.000	0.069	0.025	-0.21		516.29	184.07			2.29	185.23
67				-0.01		0.307		0.045	0.028	-0.29		513.12	195.30			2.08	196.54
68 69		0.01 0.01		0.00 0.00	0.01	0.011	0.000 0.000	0.000 0.000	-0.010 0.000	1.39 0.94		511.11 507.87	205.39 216.70			2.17 1.81	206.61 218.05
	14	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.74	1.01	501.01	210.70			1.01	

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 23 (V)															
70	93		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.61	1.51	506.17	226.47			1.51	228.01
71	94			-0.01	0.00	-0.032			-0.000	0.30		502.59	238.12			1.29	239.86
72	95		0.00		0.01	0.011		0.000		0.03		500.67	248.11			0.98	250.08
73 74	96 97			-0.01 -0.06	0.00 -0.02	0.032	0.000	0.012 0.079	0.000	-0.43 -1.26		497.15 495.90	259.70 269.03			0.43 0.06	261.86 272.28
75	98			-0.06	0.00		0.000	0.079	0.010		-1.26		280.92			-0.68	284.11
76	99			-0.05	0.00	0.118		0.066	0.008	-2.24		489.50	291.57			-0.99	294.84
	100			-0.03	0.01		0.000	0.042			-1.96		303.55			-1.80	306.83
78	101	0.11	0.00	-0.01	0.02	0.118	0.000	0.018	-0.018	-3.20	-2.27	482.96	314.25			-2.10	317.81
\boldsymbol{Z}	= 24 ((Cr)															
14	38			-0.06	0.04	0.259			-0.019	-1.19		232.19	55.75			0.74	53.27
15 16	39 40		0.00	-0.03 0.01	0.04 0.04	0.249 0.251			-0.029 -0.040	-0.57 -0.25		252.37 275.93	43.63 28.15			1.64 1.89	41.41 26.27
17	41		0.00	0.00	0.05		0.000		-0.049	0.88		294.27	17.88			2.33	16.32
18	42	0.11	0.00	0.00	0.05	0.118	0.000	0.008	-0.049	1.42	2.63	315.26	4.96			2.70	3.69
19	43		0.00	0.00	0.05	0.086			-0.049	1.50		331.77	-3.48			2.77	-4.51
20	44		0.00	0.00	0.05	0.001	0.000 0.000		-0.049	0.87		351.40		19.07	0.502		-15.85
21 22	45 46		0.00	-0.03 -0.05	-0.04 0.00		0.000	0.040 0.071	0.045 0.011	1.39 0.66			-21.16 -30.40		0.503 0.020		-21.78 -30.85
23	47			-0.07	0.03		0.000		-0.010	-0.20			-35.16		0.014		-35.46
24	48	0.21	0.00	-0.05	0.03	0.226	0.000	0.083	-0.015	-0.79	2.11	411.93	-43.29	-42.82	0.007	2.13	-43.43
25	49			-0.03	0.02		0.000	0.057	-0.010	-0.84			-45.55		0.002		-45.60
26 27	50 51			-0.02 -0.01	0.00 0.00		0.000 0.000	0.038 0.017	0.006 0.002	-0.92 -0.72			-50.98 -52.26		0.001 0.001		-50.93 -52.14
28	52		0.00	0.00	-0.02	0.000		0.000	0.020	-1.27			-56.47		0.001		-56.29
29	53	0.05	0.00	0.00	0.00	0.053	0.000	0.001	0.000	-0.77	0.20	464.70	-55.70	-55.28	0.001	0.19	-55.48
30	54		0.00		0.03		0.000	0.048	-0.024	-0.86			-56.83		0.001		-56.54
31	55		0.00		0.02		0.000 0.000	0.024		-0.15			-54.54		0.001		-54.25
32 33	56 57		0.00 0.00	0.00	0.01		0.000		-0.009 -0.003	0.27 0.82			-55.43 -52.34		0.002 0.002		-55.12 -52.04
34	58		0.00		-0.02			-0.038	0.013	1.09			-52.06		0.203		-51.74
35	59		0.00		-0.02			-0.039	0.013	1.66			-48.12		0.244		-47.81
36			0.00		-0.02			-0.027	0.015	1.97			-47.21		0.213		-46.92
37 38		-0.13 -0.10		0.03				-0.028 -0.031		2.53 2.53			-42.71 -41.20		0.255 0.337		-42.46 -40.98
39	63		0.00	0.00	0.00		0.000	0.000	0.000	2.63		526.18		-40.42	0.557		-36.31
40	64		0.00	0.00	0.00		0.000	0.000	0.000	2.14		532.14					-34.23
41	65	-0.03			0.00	-0.032	0.000	0.012	-0.000	2.27	3.24	534.49	-28.63				-28.54
42	66		0.00		0.00		0.000	0.000	0.000	1.74		539.89					-25.91
43	67			-0.06	-0.01		0.000	0.084	0.024	0.47		541.97					-19.69
44 45	68 69			-0.04 -0.04	0.00		0.000	0.060	-0.009	-0.08 -0.91		546.66 548.50					-16.46 -10.27
46	70			-0.02	0.01		0.000			-1.36		552.67	-6.46			0.66	-6.45
47	71		0.00		0.00		0.000	0.011		-2.05		553.79	0.49			0.10	0.43
48	72		0.00	0.01	0.00				-0.001		-0.78		4.71			-0.76	4.62
49 50	73		0.00	0.01	0.00				-0.001				11.43			-2.04	11.32
50 51	74 75		0.00 0.00	0.00 -0.01	0.00		0.000 0.000	0.000 0.012		-3.81 -3.38			16.44 25.01			-2.64 -2.52	16.31 24.89
52	76		0.00	0.00	0.00	0.000	0.000	0.000		-2.96			31.56			-2.08	31.43
53	77	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-2.40	-1.70	561.88	40.83			-1.71	40.72
54	78	-0.01		0.00	0.00	-0.011		0.000		-1.72			48.05			-1.05	47.95
55 56	79 80		0.00 0.00		0.03		0.000 0.000		-0.025 -0.027		-0.69 -0.10		57.73 65.33			-0.46 0.14	57.89 65.52
57	81		0.00		0.03		0.000		-0.027 -0.029			559.69	75.31			0.14	75.54
58	82		0.00	0.00	0.03		0.000		-0.029			559.86	83.21			0.92	83.51
59	83			-0.06	0.01		0.000	0.108		-2.03		557.56	93.58			1.45	94.17
60	84	0.27	0.00	-0.06	0.01	0.294	0.000	0.108	0.016	-1.79	1.14	557.66	101.56			1.67	102.24

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7 :	= 24 ((Cr)															
61	85		0.00	-0.05	0.01	0.305	0.000	0.098	0.014	-1.87	1.15	555.31	111.98			1.53	112.59
62	86	0.29	0.00	-0.05	0.02	0.316	0.000	0.102	0.004	-1.68		555.07	120.29			1.73	121.02
63	87			-0.04	0.00		0.000	0.085		-1.38		552.27	131.16			1.76	131.88
64	88			-0.03	0.00		0.000	0.072	0.016	-0.97		551.56	139.94			1.96	140.67
65	89			-0.03	0.01		0.000	0.073	0.005	-0.99		548.64	150.93			1.85	151.71
66 67	90 91			-0.02 -0.01	0.00		0.000 0.000	0.059 0.047	0.012 0.008	-0.63 -0.70		547.68 544.48	159.96 171.24			2.03 1.88	160.82 172.13
68	92		0.00	0.01			0.000	0.047	0.008	-0.70 -0.58		543.29	180.49			2.01	181.50
69	93		0.00	0.02	-0.02		0.000	0.005	0.017	-0.56		540.04	191.82			1.82	193.05
70	94	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.91	1.67	538.79	201.13			1.67	202.46
71	95			-0.01	0.00	-0.032		0.012	-0.000	0.55		535.26	212.74			1.45	214.25
72	96		0.00	0.00	0.00		0.000	0.000	0.000	0.27		534.03	222.04			1.08	223.72
73 74	97 98			-0.01 -0.02	0.00 0.00		0.000 0.000	0.012 0.025	0.000 0.001	-0.24 -0.63		530.58 529.12	233.56 243.09			0.52 0.19	235.45 245.23
75	99			-0.02	0.00	0.053		0.025	0.001	-1.33		525.52	254.77			-0.44	257.12
76	100	0.11	0.00	-0.04	0.01		0.000	0.054	-0.004	-2.18		524.22	264.14			-1.02	266.92
	101			-0.03	0.02		0.000		-0.016		-2.14		275.81			-1.87	278.83
	102			-0.01	0.02		0.000		-0.018				285.96			-2.20	289.14
79	103	0.09	0.00	0.01	0.00	0.096	0.000	-0.009	-0.001	-4.15	-3.08	514.58	297.99			-3.08	301.24
Z :	= 25 ((Mn)															
15	40	0.23		0.01	0.04		0.000		-0.040	-0.93		247.29	56.01			1.05	53.52
16	41	0.24		0.04	0.05			-0.017		-0.90		271.28	40.09			1.30	38.05
17 18	42 43		0.00 0.00	0.03 0.02	-0.05 -0.05		0.000 0.000	-0.022 -0.017	0.044 0.047	0.24 0.86		290.87 312.28	28.57 15.23			1.84 2.14	26.76 13.73
19	44		0.00	0.02	-0.05		0.000	0.007	-0.047	1.16		329.86	5.72			2.14	4.48
20	45		0.00	0.00	0.05		0.000	0.001	-0.049	0.67		349.97	-6.32			1.98	-7.32
21	46			-0.03	-0.02		0.000	0.041	0.025	1.05		365.35					-14.45
22	47	0.11	0.00	-0.03	-0.01	0.118	0.000	0.041	0.015	0.75	2.06	383.47	-23.68			2.06	-24.31
23	48			-0.04	0.01		0.000	0.067	0.002	-0.12			-29.41		0.112		-29.89
24	49			-0.03	0.00		0.000	0.054	0.009	-0.79			-37.91		0.024		-38.22
25 26	50 51			-0.01	0.00	0.228	0.000 0.000	0.031 0.014	0.004	-1.08			-42.16 -48.27		0.001		-42.96 -48.33
27	52		0.00 0.00	0.00	0.00	0.194		0.014	0.001	-1.30 -1.26			-48.27 -50.82		0.001 0.002		-48.33 -50.80
28	53	-0.02				-0.021			0.010						0.001		-55.36
29	54	0.11	0.00	-0.01	0.01	0.118	0.000	0.018	-0.008	-1.35	0.11	472.00	-55.71	-55.56	0.001	0.11	-55.54
30	55	0.16	0.00	-0.02	0.03	0.172	0.000	0.037	-0.025	-1.21	1.01	481.60	-57.24	-57.71	0.001	1.02	-57.01
31	56			-0.01	0.02		0.000		-0.017				-56.64		0.001		-56.39
32 33	57 58		0.00 0.00	0.01	0.01 -0.01		0.000	0.002 -0.023	-0.011 0.004	-0.11 0.39			-57.27 -55.37		0.002 0.030		-56.99
34	59	0.18			-0.01 -0.02			-0.023 -0.036	0.004	0.59			-55.32		0.030		-55.08 -55.00
35	60		0.00		-0.02			-0.039	0.013	1.42			-52.47		0.086		-52.16
36	61		0.00		-0.02			-0.039 -0.039	0.013	1.73			-52.47 -51.77		0.228		-52.10 -51.45
37	62	-0.13	0.00	0.03		-0.135	0.000	-0.028	-0.005	2.42	3.97	529.06	-48.20	-48.04	0.223	3.99	-47.92
38		-0.10		0.03		-0.104				2.42			-46.99		0.258		-46.73
39		-0.03		0.00		-0.032		0.000	0.000	2.66			-43.21		0.267		-43.00
40	65		0.00	0.00	0.00	0.000		0.000	0.000	2.18			-41.29	-40.67	0.537		-41.12
41 42	66 67	-0.03 -0.01				-0.032 -0.011		0.012 0.000	-0.000 0.000	2.27 1.76		549.76 555.33					-36.46 -33.99
43	68			-0.03	-0.00	0.129		0.042	0.015	1.05		558.29					-28.84
44	69			-0.03	0.01	0.172			-0.003	0.05		563.13					-25.63
45	70	0.16	0.00	-0.03	0.01	0.172	0.000	0.048	-0.003	-0.77	1.26	565.94	-20.51			1.33	-20.41
46	71			-0.01	0.01	0.172				-1.32		570.10					-16.55
47	72 73		0.00	0.00	0.00	0.172		0.011		-2.13		572.42 576.47					-10.85
48 49	73 74	0.12	0.00 0.00	0.01 0.01	-0.01 0.00			-0.007 -0.010		-2.40 -3.09	-0.85 -2.07	576.47 578.67	-6.82 -0.95			-0.83 -2.06	-6.83 -1.00
50	75		0.00	0.00	0.00		0.000	0.000		-3.97			3.79			-2.79	3.72
51	76			-0.00	0.00		0.000	0.000		-3.42			11.67			-2.79 -2.49	11.60

N	A	$arepsilon_2$	ϵ_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 25 ((Mn)															
52		-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-2.93	-2.06	583.85	18.08			-2.06	18.00
53	78	-0.01		0.00		-0.011		0.000	0.000	-2.28	-1.57		26.63			-1.57	26.56
54	79	-0.02		0.00	0.00	-0.021		0.000	0.000	-1.57	-0.89		33.76			-0.89	33.69
55	80	0.16	0.00	-0.01	0.02	0.172	0.000	0.024	-0.017	-1.88	-0.42	583.42	42.73			-0.32	42.77
56	81	0.17	0.00	0.00	0.03	0.184	0.000	0.014	-0.029	-1.41	0.04	584.13	50.09			0.26	50.27
57	82	0.18	0.00	0.01	0.02	0.195	0.000	0.003	-0.021	-1.01	0.51	582.83	59.46			0.62	59.57
58	83	0.19		0.01	0.03		0.000	0.006	-0.031	-0.66		583.27	67.09			1.07	67.37
59	84			-0.04	0.00		0.000	0.082		-1.62		581.55	76.88			1.58	77.22
60	85			-0.04	0.01		0.000	0.085	0.009	-1.56		581.65	84.85			1.84	85.23
61	86			-0.04	0.01		0.000	0.088	0.010	-1.85		580.18	94.39			1.71	94.82
62	87			-0.03	0.01		0.000	0.078	0.007	-1.62		579.96	102.69			1.88	103.12
63 64	88 89			-0.02 -0.01	0.02 0.01		0.000 0.000	0.067 0.053	-0.007 -0.001	-1.48 -1.14		578.04 577.47	112.68 121.32			1.82 1.96	113.14 121.79
65	90		0.00	0.00	0.00		0.000	0.033	0.001	-1.14 -1.17		575.35	131.51			1.77	132.01
66	91	0.30			-0.01		0.000	0.026	0.011	-0.90		574.49	140.44			1.97	141.06
67	92	0.29			-0.03		0.000		0.023	-0.99		572.27	150.73			1.85	151.67
68	93	0.20			-0.03			-0.014	0.019	-1.04		571.19	159.88			1.95	160.95
69	94	0.28	0.00	0.03	-0.02	0.308	0.000	-0.005	0.013	-0.97		568.47	170.68			1.69	171.72
70	95	0.28	0.00	0.04	-0.02	0.309	0.000	-0.017	0.010	-0.84	1.65	567.18	180.04			1.73	181.26
71	96	0.28	0.00	0.05	-0.02	0.309	0.000	-0.029	0.006	-1.10	1.35	564.38	190.91			1.46	192.31
72	97	0.03	0.00	-0.01	0.00	0.032	0.000	0.012	0.000	0.47	1.11	563.07	200.29			1.12	201.76
73	98	-0.03		0.01	-0.02	-0.032		-0.011	0.020	-0.09		560.22	211.21			0.77	213.00
74	99		0.00		0.00		0.000	0.025	0.001	-0.51		558.80	220.71			0.28	222.58
	100		0.00		0.00		0.000	0.025	0.001	-1.25		555.86	231.71			-0.38	233.77
	101	-0.04		0.00	-0.01	-0.042		0.001	0.010	-1.52		554.20	241.44			-0.79	243.70
	102		0.00		0.01		0.000	0.030	-0.007	-2.99		551.48	252.24			-1.86	254.75
	103 104	0.11	0.00	0.00 0.01	0.01		0.000 0.000	0.005 -0.009	-0.010 -0.001	-3.37 -4.30	-2.28 -3.20	549.54 546.41	262.25 273.45			-2.26 -3.20	264.93 276.34
	105	0.00		0.00	0.00		0.000	0.000	0.001		-3.66		283.57			-3.66	286.71
	= 26 (0.00	0.00	0.05	0.200	0.000	0.006	0.024	1.50	0.50	260.05	40.50			0.72	45.05
16 17	42 43	0.26	0.00		-0.05 -0.05			-0.086 -0.060	0.024 0.036	-1.59 -0.24	0.53 1.09	269.07 289.07	49.58 37.66			0.72 1.20	47.35 35.68
18		-0.20		0.00		-0.154			-0.040	-0.24 0.26		311.99	22.81			1.37	21.12
19	45		0.00		-0.05			-0.011	0.049	0.55		329.87	12.99			1.83	11.57
20	46		0.00		0.05		0.000	0.000	-0.049	-0.14		351.31	-0.37			1.29	-1.55
21	47	0.06	0.00	-0.01	-0.05	0.065	0.000	0.013	0.051	0.63	1.80	367.12	-8.11			1.84	-9.07
22	48	0.01	0.00	0.00	0.01	0.011	0.000	0.000	-0.010	0.43		386.38	-19.29			1.46	-20.09
23	49	0.13	0.00	-0.01	-0.01	0.140	0.000	0.019	0.012	0.38	1.81	400.63	-25.48			1.80	-26.09
24	50			-0.01			0.000	0.025	0.014	-0.71			-35.05		0.060		-35.49
25	51	0.18	0.00	0.01	-0.01	0.195	0.000	0.001	0.009	-0.98	1.27	431.30	-40.01	-40.22	0.015	1.26	-40.32
26	52		0.00		-0.01			-0.007		-1.18			-48.68		0.007		-48.85
27	53		0.00		-0.01			-0.008	0.009	-1.64			-51.31		0.002		-51.38
28 29	54 55		0.00	$0.00 \\ -0.01$	0.00 0.00		0.000 0.000	0.000 0.012	0.000 0.000	-2.31			-57.11 -57.78		0.001 0.001		-57.09 -57.69
30	56			-0.01 -0.02	0.00		0.000		-0.007	-1.70 -1.35			-60.53		0.001		-60.37
31	57		0.00	0.00	0.01		0.000		-0.009				-59.48		0.001		-59.27
32	58		0.00	0.00	0.00				-0.009 -0.003	-0.67 -0.45			-61.78		0.001		-39.27 -61.52
33	59		0.00	0.02	0.00				-0.007	-0.14			-60.08		0.001		-59.79
34	60		0.00		-0.02			-0.050	0.011	0.13			-61.18		0.003		-60.84
35	61	0.15	0.00	0.05	-0.02	0.163	0.000	-0.052	0.012	0.80	2.78	530.65	-58.64	-58.92	0.020		-58.30
36	62	0.14	0.00	0.04	-0.02	0.152	0.000	-0.041	0.014	1.28	2.85	539.10	-59.02	-58.90	0.014	2.89	-58.68
37	63	-0.12		0.01	0.00	-0.125			0.001	1.84			-55.76		0.168	3.21	-55.47
38	64	-0.08		0.02	0.01	-0.084			-0.008	1.84			-55.63		0.277		-55.35
39	65		0.00	0.00	0.00		0.000	0.000	0.000	1.87			-51.94		0.243		-51.69
40	66	0.00		0.00	0.00		0.000	0.000	0.000	1.39			-51.07		0.303		-50.85
41	67	-0.03			0.00			0.012	-0.000	1.55			-46.54		0.416		-46.34
42	68	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	1.04	2.02	3/3.53	-45.02	-43.13	0.699	2.02	<u>-44.85</u>

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 26 (Fe)															
43	69	. ,	0.00	0.00	0.00	0.032	0.000	0.000	0.000	1.01	1.83	576.66	-40.08			1.82	-39.93
44	70	0.12	0.00	-0.02	0.00	0.128	0.000	0.030	0.003	-0.02		582.36					-37.55
45	71		0.00		0.00		0.000	0.030	0.003	-0.73			-32.49				-32.36
46	72		0.00	0.00	0.00		0.000	0.006	0.000	-1.38			-29.79				-29.70
47	73	0.12		0.01	0.00		0.000	-0.006	-0.001	-2.28		593.11					-24.19
48	74	0.12		0.02	-0.01			-0.019	0.007	-2.94			-20.92				-20.86
49 50	75 76	0.05 -0.01		0.01	0.00	-0.053	0.000	-0.011 0.000	-0.001 0.000	-3.74 -4.62			-15.32 -11.44				-15.31 -11.46
51	77		0.00		0.00		0.000	0.013	-0.009	-4.02	-2.99		-3.61			-2.97	-3.62
52	78	-0.01	0.00	0.00	0.00	-0.011		0.000	0.000	-3.49	-2.53		1.96			-2.53	1.92
53	79	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-2.75	-1.97	606.84	10.45			-1.97	10.41
54	80	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-1.97	-1.27	608.60	16.76			-1.27	16.73
55	81		0.00		0.02		0.000	0.024	-0.017	-2.06		607.34	26.09			-0.22	26.17
56	82	0.17		0.00	0.03		0.000	0.014		-1.56		608.90	32.61			0.33	32.80
57	83	0.17		0.01	0.03		0.000		-0.031	-1.08		607.81	41.77			0.70	42.00
58 59	84 85	0.18		0.02 -0.04	0.02		0.000 0.000	-0.009 0.083	-0.023 0.008	-0.66 -1.70		608.88 606.97	48.77 58.75			1.12 1.99	48.96 59.06
60	86			-0.04 -0.03	0.01		0.000		-0.008	-1.70 -1.73		607.89	65.90			2.20	66.24
61	87			-0.03	0.02		0.000		-0.003	-2.06		606.89	74.98			1.69	75.35
62	88	0.30	0.00	-0.02	0.02	0.328	0.000	0.067	-0.007	-1.71	1.63	607.48	82.45			1.82	82.85
63	89	0.31	0.00	-0.01	0.03	0.340	0.000	0.059	-0.020	-1.84	1.44	605.83	92.17			1.67	92.69
64	90			-0.01	0.02		0.000		-0.011	-1.40		605.95	100.13			1.86	100.62
65	91	0.30		0.01	0.01		0.000	0.029	-0.009	-1.36		603.77	110.38			1.73	110.83
66 67	92 93	0.30 0.30		0.02	0.00 -0.01		0.000 0.000	0.015	-0.002 0.004	-1.15 -1.36		603.68 601.28	118.54 129.01			1.86 1.77	119.07 129.63
68 69	94 95	0.30 0.30			-0.02 -0.02			-0.012 -0.024	0.009 0.006	-1.37 -1.58		601.08 598.55	137.29 147.88			1.80 1.55	138.12 148.85
70	96	0.30			-0.02			-0.024 -0.036	0.000	-1.50		597.97	156.54			1.64	157.71
71	97	0.30			-0.02			-0.036	0.002	-1.74		595.19	167.39			1.34	168.67
72	98	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.37	1.07	594.42	176.23			1.06	177.49
73	99	0.02	0.00	0.00	0.00		0.000	0.000	0.000	-0.16		591.58	187.14			0.58	188.55
	100		0.00		0.00		0.000	0.013	0.001	-0.61		590.89	195.90			0.14	197.50
	101			-0.01	0.00		0.000	0.013	0.001		-0.55		206.86			-0.54	208.63
	102 103			-0.02 -0.02	0.01		0.000 0.000		-0.007 -0.007								217.77 228.95
	104		0.00	0.01	0.00				-0.001				236.13			-2.36	238.49
	104	0.05		0.00	0.00		0.000		-0.001 -0.010				247.11			-2.30 -3.44	249.72
	106		0.00	0.00	0.00		0.000	0.000		-5.19			256.51				259.30
81	107	0.01	0.00	0.01	0.00	0.011	0.000	-0.012	-0.000	-6.50	-5.21	575.64	267.65			-5.19	270.70
Z:	= 27 ((Co)															
17		-0.23	0.00	0.01	0.05	-0.237	0.000	0.006	-0.045	-0.88	0.66	284.06	49.96			0.74	47.74
18		-0.20		0.04					-0.037			307.33	34.75			0.89	32.84
19	46	0.08	0.00		-0.01			-0.010	0.009	-0.12	1.42	326.44	23.72			1.41	22.01
20	47		0.00		-0.02			-0.012		-0.79		348.28	9.95			0.81	8.52
21	48			-0.01			0.000	0.013		-0.08		365.47	0.83			1.33	-0.35
22	49		0.00		-0.01		0.000	0.001		-0.39			-10.72				-11.69
23 24	50 51		0.00 0.00	0.00 -0.01	0.00		0.000 0.000	0.002 0.014	0.000 -0.009	0.07			-18.38 -28.41				-19.16 -29.00
25	52		0.00	0.00	0.00		0.000	0.014		-0.30 -0.97			-26.41 -34.64				-29.00 -35.08
26	53			-0.01	0.00		0.000	0.014					-43.34	-42.65	0.018	-0.57	
27	54	0.05	0.00	0.00	0.00	0.053	0.000	0.001	0.000	-2.38	-1.11	462.75	-48.02	-48.01	0.001	-1.11	-48.75
28	55	0.04	0.00	0.01	0.00		0.000	-0.011					-54.37			-1.74	
29	56	0.07		0.00	0.00		0.000	0.002					-56.16		0.002		
30	57	0.10		0.00	0.00		0.000	0.004					-59.30		0.001		-59.20
31	58		0.00	0.00	0.00		0.000	0.003		-1.04			-59.69		0.001		-59.53
32	59		0.00	0.00	0.00		0.000	0.005		-0.46			-61.67		0.001		-61.47
	60	0.14	0.00	0.03	-0.01	0.151	0.000	-0.029	0.005	-0.18	1.//	324.10	-60.95	-01.65	0.001	1./8	-60.70

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 27 ((Co)															
34	61	` '	0.00	0.04	-0.02	0.152	0.000	-0.041	0.014	0.17	2.07	533.54	-62.32	-62.90	0.001	2.09	-62.03
35	62		0.00		-0.01			-0.043	0.005	0.74			-61.13		0.020		-60.83
36	63		0.00		-0.01			-0.032	0.007	1.18			-61.74		0.020		-61.44
37 38	64 65	-0.10	0.00	0.02 0.01	0.01			-0.019 -0.011		1.41 1.44			-59.68 -59.65		0.020 0.013		-59.39 -59.37
39	66		0.00	0.01	0.00			-0.012		1.33			-56.90		0.252		-56.63
40	67		0.00	0.00	0.00		0.000	0.000	0.000	0.93			-56.19		0.318		-55.93
41	68		0.00	0.01	-0.01		0.000	-0.012	0.009	1.07			-52.67		0.318		-52.42
42	69		0.00	0.00	0.00		0.000	0.000	0.000	0.58			-51.33		0.335		-51.11
43	70		0.00	0.00	0.00		0.000	0.001	0.000	0.45			-47.37		0.838		-47.17
44 45	71 72		0.00 0.00	0.00 -0.01	0.00		0.000 0.000	0.001	0.000 0.002	-0.06 -1.00		597.32	-45.38 -40.78	-43.87	0.838		-45.21 -40.62
46	73		0.00	0.00	0.00		0.000	0.006	0.002			606.34					-38.13
47	74	0.12	0.00	0.01	0.00	0.129	0.000	-0.006	-0.001	-2.62	-0.92	609.80	-33.65				-33.54
48	75	0.04	0.00	0.01	0.00	0.043	0.000	-0.011	-0.000	-3.09	-2.06	615.16	-30.93			-2.06	-30.86
49	76		0.00	0.01	0.00				-0.000								-25.86
50	77		0.00	0.00	0.00		0.000	0.000		-5.14							-22.16
51 52	78 79		0.00 0.00	0.01	0.00		0.000 0.000	-0.011 0.000	-0.000	-4.51 -3.91			-15.14 -9.64			-3.32 -2.81	-15.12 -9.64
53	80		0.00	0.00	0.00				-0.000				-1.94			-2.18	-1.93
54	81	0.04	0.00	0.01	0.00	0.043	0.000	-0.011	-0.000	-2.35	-1.52	628.44	4.21			-1.52	4.22
55	82		0.00	0.01	0.00				-0.000		-0.97		12.32			-0.97	12.33
56	83		0.00	0.01	0.00				-0.000			629.85	18.94			-0.31	18.96
57	84		0.00		0.02		0.000		-0.018	-0.58		629.13	27.74			0.56	27.85
58	85		0.00	0.00	0.02		0.000			-0.21		630.33	34.61			1.03	34.74
59 60	86 87		0.00	0.01 -0.02	0.02		0.000 0.000	-0.002	-0.021 -0.007	0.28 -1.54		629.62 630.03	43.39 51.05			1.40 2.29	43.56 51.31
61	88			-0.02	0.02		0.000		-0.007	-1.87		629.29	59.86			2.26	60.13
62	89	0.30	0.00	-0.01	0.01		0.000	0.053	-0.001	-1.58		629.95	67.27			2.39	67.53
63	90	0.31	0.00	0.00	0.02	0.340	0.000	0.045	-0.014	-1.76	1.73	629.43	75.86			1.81	76.18
64	91		0.00	0.01	0.01		0.000		-0.009			629.73	83.64			1.93	83.96
65	92 93		0.00	0.02	0.00		0.000 0.000		-0.002			628.38	93.06			1.78	93.40
66 67	93		0.00 0.00		-0.00				-0.006 -0.000			628.46 626.90	101.05 110.68			1.85 1.64	101.50 111.22
68	95		0.00		-0.02				0.002			626.90					119.55
69	96	0.31	0.00	0.07	-0.02	0.346	0.000	-0.046	-0.002	-2.10	1.17	625.05	128.67			1.38	129.61
70	97		0.00	0.07	-0.02	0.334	0.000	-0.048	-0.002	-1.85		624.41	137.38			1.54	138.47
71			0.00		-0.02				-0.002				147.55			1.23	148.74
72	99 100		0.00 0.00	0.00	0.00		0.000 0.000	0.000 0.001	0.000	0.27 -0.31		621.55 619.48	156.39 166.53				157.48 167.76
	101 102			-0.01 -0.01	0.00		0.000 0.000	0.013 0.013		-0.81 -1.58			175.32 185.62			-0.01 -0.71	176.71 187.17
	103		0.00	0.00	0.00		0.000	0.001		-2.12			194.59			-1.20	196.29
77	104		0.00	0.00	0.00	0.053	0.000	0.001	0.000	-3.12	-2.12	613.39	204.91			-2.12	206.79
	105		0.00	0.01	0.00				-0.001				214.02			-2.69	216.10
	106		0.00	0.01	0.00				-0.001				224.37				226.65
	107 108		0.00	0.01	0.00				-0.000				233.69			-4.44 5.69	236.17 246.85
	108		0.00 0.00	0.01	0.00		0.000		-0.000 0.000								256.69
			5.50	0.00	0.00	5.011	0.000	3.000	3.000	,	0.2 r	551.00	_55.11			0.21	
	= 28 (0.00	0.02	0.05	0.267	0.000	0.000	0.041	1 75	0.51	204.05	11 12			0.61	40.24
18 19		-0.26 -0.05		0.02		-0.267 -0.052		-0.000 0.002	-0.041	-1.75 -0.74		304.95 325.34	44.43 32.10			0.61 0.19	42.34 30.27
20	48		0.00		-0.04	0.000		0.002		-0.74 -1.61		348.01	17.51			0.19	15.88
21	49	-0.04	0.00		0.01	-0.042	0.000		-0.010		0.56	365.47	8.12			0.56	6.74
22	50	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-1.12	0.28	386.29	-4.63			0.27	-5.78
23			0.00	0.00	0.01	0.021			-0.010			402.11					-13.32
_24	52	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-1.09	0.03	421.44	-23.64			0.03	-24.38

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 28 (Ni)															
25	,	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-1.28	-0.20	436.22	-30.35			-0.20	-30.92
26	54		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.32			-40.24		0.050		-40.66
27 28	55 56		0.00 0.00	0.00 0.00	0.00 0.00	0.032 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-2.98 -4.00			-45.66 -54.04		0.011 0.011		-45.95 -54.21
29	57		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.24			-54.04 -55.98		0.011		-56.05
30	58		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.37			-60.49		0.001		-60.47
31	59		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.44			-61.07		0.001		-60.98
32	60		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.56			-64.33		0.001		-64.18
33	61		0.00	0.01	0.00	0.107	0.000	-0.008	-0.001	-0.14			-63.54		0.001		-63.34
34	62		0.00	0.02		0.107		-0.020	0.008	0.27			-65.95		0.001		-65.71
35 36	63 64	-0.10	0.00	0.02 0.01	-0.01 0.00	0.107 -0.094		-0.020 -0.008	0.008	0.62 0.77	1.87		-64.93 -66.85		0.001		-64.67 -66.57
37		-0.09 -0.08		0.01	0.00	-0.094 -0.084		-0.008 -0.009	0.001	0.77			-65.04		0.001		-64.75
38	66		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.73			-65.91		0.001		-65.62
39	67	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.51	1.78	582.37	-63.49	-63.74	0.003	1.78	-63.21
40	68		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.09			-63.80		0.003		-63.52
41	69	-0.02		-0.01	0.00	-0.021	0.000	0.012	-0.000	0.28			-60.45		0.004		-60.19
42	70		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.21			-60.07		0.346		-59.82
43 44	71 72		0.01	0.00 0.00	0.01	0.000 0.000	-0.013 0.000	0.000 0.000	-0.010 0.000	-0.22 -0.67			-56.18 -55.12		0.368 0.436		-55.94 -54.91
45	73		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.07		618.23		33.71	0.150		-50.75
46	74	-0.00		0.00	0.00	-0.011	0.000	0.000	0.000	-1.07		624.72					-30.73 -49.19
47	75		0.00	0.00	0.01	0.021	0.000	0.000	-0.010	-2.66		628.39					-44.80
48	76	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.70	-2.56	634.37	-42.86			-2.56	-42.74
49	77	0.03	0.00	0.01	0.00	0.032	0.000	-0.012	-0.000	-4.89	-3.56	637.56	-37.97			-3.56	-37.87
50	78		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.89		642.95					-35.21
51	79	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000	-5.06		643.99					-28.20
52 53	80 81		0.00 0.00	0.00 0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-4.47 -3.57		647.38 647.74					-23.53 -15.83
54	82		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.57 -2.69		650.40					-13.83 -10.43
55	83		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-1.85		650.37	-2.35			-1.09	-2.33
56	84		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.07		652.57	3.52			-0.37	3.55
57	85	-0.12	0.00	-0.03	0.01	-0.124	0.000	0.040	-0.014	-0.70	0.44	651.94	12.22			0.55	12.36
58	86		0.00		0.00	0.000	0.000	0.000	0.000			654.04	18.19			0.79	18.23
59	87			-0.02	0.03	0.294	0.000		-0.019			652.79	27.50			2.03	27.80
60	88			-0.02	0.03	0.328	0.000		-0.017			654.51	33.87			2.37	34.22
61 62	89 90			-0.02 -0.01	0.03	0.328 0.328	0.000 0.000		-0.017 -0.021			653.97 655.47	42.47 49.05			2.24 2.35	42.83 49.45
63	91		0.00	0.00	0.03	0.340	0.000		-0.024			654.99	57.60			1.79	58.02
64	92	0.31	0.00	0.01	0.03	0.341	0.000	0.034	-0.027	-1.68	1.66	656.10	64.55			1.92	65.07
65	93	0.31	0.00	0.02	0.02	0.342	0.000	0.021	-0.022	-1.73	1.65	654.73	73.99			1.79	74.43
66	94		0.00	0.03	0.01	0.331	0.000		-0.016			655.47	81.33			1.86	81.80
67	95		0.00		-0.01	0.333			-0.004			653.96	90.91			1.65	91.45
68 69	96 97		0.00 0.00		-0.02 -0.02	0.333 0.346		-0.036 -0.046	-0.002 -0.002	-1.83		654.61 652.86	98.33 108.15			1.61 1.37	99.07 109.01
70	98		0.00		-0.02 -0.02	0.347			-0.002 -0.006			653.09	115.99				117.07
70	98 99		0.00		-0.02 -0.01	0.347			-0.006 -0.011			650.96	115.99			1.42	117.07
	100		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.15		650.81	134.42			0.87	135.35
	101		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-0.38	0.38	648.69	144.61			0.38	145.67
74	102	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-0.89	-0.08	648.70	152.67			-0.08	153.87
	103		0.00	0.00	0.00	0.011	0.000	0.000		-1.61			162.93				164.27
	104		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-2.20	-1.28		171.21			-1.28	172.70
	105 106		0.00 0.00	-0.01 0.00	0.00 0.00	0.053 0.043	0.000 0.000	0.013		-3.27 -3.92	-2.23 -2.84	644.12	181.46 189.92			-2.22 -2.84	183.12 191.74
		-0.04		0.00		-0.043	0.000	0.001 0.001			-2.84 -4.12		200.08			-2.84 -4.09	202.12
	108		0.00	0.00		0.000	0.000	0.000		-6.02							210.91
	109		0.00		-0.00	0.000		-0.012		-0.02 -7.46							221.52
													.,				

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 28 (Ni)															
	110	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.20	-6.76	637.93	228.01			-6.76	230.60
83	111	-0.01	0.00	-0.01	0.00	-0.010	0.000	0.012	-0.000	-7.67	-6.38	633.74	240.27			-6.37	243.10
Z :	= 29 (Cu)															
19		-0.06	0.00	0.02	-0.05	-0.063	0.000	-0.021	0.050	-0.67	0.14	320.04	44.70			0.27	42.75
20	49		0.00		-0.03	0.011		0.000	0.030	-1.31		342.89	29.92			0.17	28.14
21	50			-0.02		0.065		0.025		-0.37		361.28	19.60			1.06	18.08
22 23	51 52	0.02		0.01 -0.01	0.00	0.021	0.000 0.000	-0.012 0.015	-0.000 -0.009	-0.61 -0.02		382.55 399.49	6.40 -2.47			0.58 1.08	5.08 -3.57
24	53			-0.01	0.00		0.000	0.015		-0.52		419.07					-14.88
25	54			-0.02	0.01		0.000	0.029	-0.007	-0.78		434.87					-22.43
26	55			-0.01	0.00	0.064		0.014	0.001	-1.50		453.15					-32.47
27	56			-0.01	0.00		0.000	0.014	0.001	-2.17		467.75		47.21	0.016		-38.85
28	57		0.00	0.00	0.00	0.043		0.001		-2.93			-46.94		0.016		-47.22
29 30	58 59			-0.03 -0.03	0.00	0.064 0.106		0.038		-2.49 -1.88			-50.70 -55.72		0.002 0.001		-51.39 -55.79
31	60			-0.03 -0.02	0.02	0.100				-1.88 -1.19			-57.46		0.001		-57.45
32	61			-0.01	0.02		0.000		-0.018	-0.62			-60.75		0.001		-60.66
33	62	0.14	0.00	0.01	0.01	0.151	0.000	-0.003	-0.011	-0.03	1.90	539.31	-61.58	-62.80	0.004	1.89	-61.44
34	63	0.14		0.02	0.00			-0.016	-0.003	0.39			-64.28		0.001		-64.08
35	64	0.11		0.02	0.00			-0.019	-0.002	1.04			-64.47		0.001		-64.25
36 37		-0.12 -0.12		0.01	-0.01	-0.125 -0.125			0.011 0.001	1.19 1.31			-66.46 -65.67		0.001 0.001		-66.20 -65.40
38		-0.08		0.01		-0.084			0.001	1.42			-66.91		0.001		-66.63
39		-0.03		0.00		-0.032		0.000	0.000	1.47			-65.43		0.002		-65.15
40	69	-0.01		0.00	0.00	-0.011		0.000	0.000	1.13			-65.82		0.001		-65.54
41	70			-0.02	0.00	0.053		0.025	0.001	1.13	2.20	605.80	-63.50	-62.98	0.002	2.20	-63.21
42	71			-0.01	0.00	0.032		0.012	0.000	0.76			-63.26		0.001		-62.99
43	72			-0.02	0.00	0.075		0.026	0.002	0.47			-60.40		0.001		-60.14
44 45	73 74			-0.03 -0.03	0.01	0.085 0.128		0.039 0.043	-0.007 -0.005	-0.25 -1.14			-59.54 -56.11		0.004 0.006		-59.28 -55.85
46	75			-0.03	0.01	0.128			-0.003	-1.14			-54.70		0.000		-53.63 -54.47
47	76	0.12	0.00	-0.01	0.01	0.128	0.000	0.019	-0.008	-2.60	-0.79	641.84	-51.11	-50.98	0.007	-0.77	-50.91
48	77	0.07	0.00	-0.01	0.00	0.075	0.000	0.014	0.001	-3.02	-1.76	648.10	-49.30			-1.75	-49.14
49	78		0.00	0.00	0.00	0.064		0.002				652.24					-45.23
50	79			-0.02	0.00	0.032		0.024				657.70					-42.62
51 52	80 81			-0.02 -0.02	0.00 0.00		0.000 0.000	0.025 0.025				659.73 663.25					-36.60 -32.06
53	82			-0.02	0.00	0.053		0.025				664.45					-25.20
54	83	0.12	0.00	-0.03	0.01	0.128	0.000	0.043	-0.005	-2.43	-0.72	666.89	-19.66			-0.65	-19.52
55	84	0.12	0.00	-0.03	0.02	0.128	0.000	0.043	-0.015	-1.80	-0.21	667.83	-12.53				-12.37
56	85			-0.02	0.04		0.000		-0.035			670.27	-6.89			0.67	-6.57
57 58	86 87			-0.01 -0.01	0.04	0.172 0.172	0.000		-0.037 -0.037			670.74 672.97	0.71 6.55			1.18 1.54	1.03 6.90
59 60	88 89			-0.01 -0.03	0.03		0.000 0.000		-0.025 -0.016			672.83 674.66	14.76 21.00			2.10 2.45	15.00 21.33
61	90			-0.03	0.03	0.305			-0.015			674.75	28.98			2.47	29.32
62	91	0.28	0.00	-0.02	0.03	0.305			-0.018			676.64	35.17			2.27	35.53
63	92			-0.01	0.03	0.328		0.056	-0.021	-1.43		676.42	43.45			2.18	43.81
64	93		0.00	0.00	0.03	0.318			-0.025			677.58	50.36			2.34	50.79
65 66	94 95	0.29 0.28		0.01 0.02	0.02	0.318 0.308			-0.019 -0.013			676.90 677.80	59.12 66.29			2.25 2.23	59.47 66.65
67	93 96	0.28		0.02	0.01				-0.013 -0.010			676.99	75.17			2.23	75.59
68	97	0.29			-0.01				-0.004			677.65	82.58			1.99	83.12
69	98	0.28	0.00	0.05	-0.01	0.310	0.000	-0.028	-0.004	-1.31	1.65	676.56	91.75			1.74	92.36
70	99	0.27	0.00	0.05	-0.01	0.298	0.000	-0.030	-0.003	-1.12	1.60	676.83	99.54			1.71	100.26
	100	0.27			-0.01				-0.007			675.57	108.88			1.39	109.75
12	101	0.27	0.00	0.06	-0.01	0.299	0.000	-U.U42	-0.007	-1.29	1.28	675.41	11/.10			1.46	118.09

	N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
73 102 0.05 0.00 −.002 0.00 0.055 0.00 0.055 0.00 0.055 0.00 0.055 0.00 0.055 0.00 0.005 0.00 0.005 0.00 0.005 0.00 0.005 0.00 0.005 0.0	7	- 20 ((C11)															
74 10 0.05 0.01 0.00 0.00 0.005 0.00 0.005 0.00 0.004 0.004 0.004 0.004 0.005 0.004 0.004 0.005		`	. /	0.00	_0.02	0.00	0.053	0.000	0.025	0.001	0.20	0.66	674 09	126 49			0.70	127.45
1																		
74 76 76 76 76 76 76 76																		
17 18 18 18 19 19 10 10 10 10 10 10																		
	77	106	0.09	0.00	-0.02	0.01	0.096	0.000	0.028	-0.008	-3.12	-1.99	670.94	161.93			-1.92	163.44
	78	107	0.06	0.00	-0.01	0.01	0.064	0.000	0.014	-0.009	-3.63	-2.59	670.58	170.36			-2.54	172.00
			0.05	0.00	-0.01		0.053	0.000	0.013					180.00				181.77
	80	109	0.04	0.00	-0.01	0.00			0.013	0.001	-5.67	-4.47	668.50	188.59			-4.46	190.53
	82	111	0.01	0.00	-0.01	0.00	0.011	0.000	0.012	0.000	-7.88	-6.49	666.06	207.17			-6.48	209.48
21 51 0.08 0.00 -0.02 -0.00 0.000 </td <td>83</td> <td>112</td> <td>0.03</td> <td>0.00</td> <td>-0.02</td> <td>0.00</td> <td>0.032</td> <td>0.000</td> <td>0.024</td> <td>0.001</td> <td>-7.47</td> <td>-6.22</td> <td>662.57</td> <td>218.73</td> <td></td> <td></td> <td>-6.17</td> <td>221.29</td>	83	112	0.03	0.00	-0.02	0.00	0.032	0.000	0.024	0.001	-7.47	-6.22	662.57	218.73			-6.17	221.29
22 22 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.003 -0.051 -0.16 1.88 397.92 6.39 1.94 5.23 24 54 0.16 0.00 -0.04 0.06 0.171 0.000 0.083 -0.051 -0.72 1.32 418.67 -6.28 1.94 5.23 25 55 0.16 0.00 -0.02 0.00 0.00 0.003 0.005 -0.01 1.13 434.73 -14.27 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.51 1.32 -1.42 0.00 -0.03 -0.02 -0.03 0.00	$oldsymbol{Z}$:	= 30 ((Zn)															
23 3. 0.16 0.00 -0.04 0.06 0.171 0.000 0.063 -0.051 -0.72 1.32 1.434 7.02 1.42 7.24 1.22 1.32 1.434 7.02 1.22 1.32 1.31 1.434 7.02 1.32 1.51 25 55 0.13 0.00 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																		
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28 58 0.00 0.00 0.00 0.000 <td></td>																		
29 99 0.10 0.00 -0.03 0.02 0.106 0.000 0.041 -0.016 -0.042 -1.67 -0.09 499,25 -46,51 -47,26 0.031 -0.09 -46,78 31 61 0.15 0.00 -0.00 0.04 0.161 0.000 0.036 -0.80 1.44 \$24,11 -55,23 -56,35 0.016 1.45 -55,29 32 62 0.18 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.02 2.14 -62,21 536,75 -59,80 -61,17 0.00 2.01 -61,37 0.00 0.00 2.02 557,80 -64,71 -66,00 -0.02 -64,85 3.1 566 -61,71 0.00 0.01 -0.00 -0.00 -0.00 -0.00 0.00 0.00 -0.00 0.00 0.00 -0.00 0.00 0.00 -0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0															42.30	0.050		
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	37				0.01	-0.01	-0.176	0.000	0.001	0.010	1.65					0.001	3.44	-67.22
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	38	68	-0.13	0.00	0.03	0.00	-0.136	0.000	-0.027	0.004	1.86	3.16	595.18	-69.80	-70.01	0.001	3.18	-69.52
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53 83 0.12 0.00 -0.04 0.02 0.128 0.000 0.056 -0.014 -2.65 -0.79 682.22 -35.77 -0.67 -35.55 54 84 0.16 0.00 -0.03 0.04 0.171 0.000 0.050 -0.033 -2.32 -0.12 685.92 -31.40 0.14 -31.07 55 85 0.16 0.00 -0.03 0.04 0.171 0.000 0.050 -0.033 -1.86 0.30 687.09 -24.50 0.56 -24.17 56 86 0.17 0.00 -0.02 0.05 0.183 0.000 0.045 -1.34 0.76 690.49 -19.82 1.15 -19.37 57 87 0.18 0.00 -0.01 0.04 0.194 0.000 0.029 -0.037 -0.77 1.38 690.96 -12.23 1.65 -11.90 58 88 0.19 0.00 -0.01 0.04 0.238																		
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55 85 0.16 0.00 -0.03 0.04 0.171 0.000 0.050 -0.033 -1.86 0.30 687.09 -24.50 0.56 -24.17 56 86 0.17 0.00 -0.02 0.05 0.183 0.000 0.040 -0.045 -1.34 0.76 690.49 -19.82 1.15 -19.37 57 87 0.18 0.00 -0.01 0.04 0.194 0.000 0.029 -0.037 -0.77 1.38 690.96 -12.23 1.65 -11.90 58 88 0.19 0.00 -0.01 0.04 0.205 0.000 0.031 -0.036 -0.41 1.74 693.97 -7.16 2.03 -6.81 59 89 0.22 0.00 -0.01 0.04 0.238 0.000 0.037 -0.035 -0.32 2.13 694.22 0.65 2.42 1.02 60 90 0.25 0.00 -0.03 0.30																		
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58 88 0.19 0.00 -0.01 0.04 0.205 0.000 0.031 -0.036 -0.41 1.74 693.97 -7.16 2.03 -6.81 59 89 0.22 0.00 -0.01 0.04 0.238 0.000 0.037 -0.035 -0.32 2.13 694.22 0.65 2.42 1.02 60 90 0.25 0.00 -0.03 0.03 0.271 0.000 0.067 -0.017 -0.60 2.44 696.80 6.15 2.69 6.48 61 91 0.28 0.00 -0.03 0.30 0.305 0.000 0.075 -0.015 -1.21 2.20 697.27 13.76 2.45 14.10 62 92 0.28 0.00 -0.02 0.03 0.305 0.000 0.062 -0.018 -0.89 2.30 699.62 19.47 2.55 19.84 63 93 0.30 0.00 -0.01 0.03 0.328 0.000 0.056 -0.021 -1.19 2.26 699.48 27.69 2.4																		
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61 91 0.28 0.00 -0.03 0.30 0.305 0.000 0.075 -0.015 -1.21 2.20 697.27 13.76 2.45 14.10 62 92 0.28 0.00 -0.02 0.03 0.305 0.000 0.062 -0.018 -0.89 2.30 699.62 19.47 2.55 19.84 63 93 0.30 0.00 -0.01 0.03 0.328 0.000 0.056 -0.021 -1.19 2.26 699.48 27.69 2.48 28.05 64 94 0.28 0.00 0.02 0.306 0.000 0.037 -0.016 -0.51 2.55 701.22 34.01 2.68 34.33																		
62 92 0.28 0.00 -0.02 0.03 0.305 0.000 0.062 -0.018 -0.89 2.30 699.62 19.47 2.55 19.84 63 93 0.30 0.00 -0.01 0.03 0.328 0.000 0.056 -0.021 -1.19 2.26 699.48 27.69 2.48 28.05 64 94 0.28 0.00 0.02 0.306 0.000 0.037 -0.016 -0.51 2.55 701.22 34.01 2.68 34.33	60	90	0.25	0.00	-0.03	0.03	0.271	0.000	0.067	-0.017	-0.60	2.44	696.80	6.15			2.69	6.48
63 93 0.30 0.00 -0.01 0.03 0.328 0.000 0.056 -0.021 -1.19 2.26 699.48 27.69 2.48 28.05 64 94 0.28 0.00 0.00 0.02 0.306 0.000 0.037 -0.016 -0.51 2.55 701.22 34.01 2.68 34.33																		
64 94 0.28 0.00 0.00 0.02 0.306 0.000 0.037 -0.016 -0.51 2.55 701.22 34.01 2.68 34.33																		
05 95 0.28 0.00 0.01 0.02 0.507 0.000 0.025 -0.019 -0.65 2.44 700.76 42.54 2.57 42.88																		
	-05	95	0.28	0.00	0.01	0.02	0.307	0.000	0.025	-0.019	-0.63	2.44	/00./6	42.54			2.57	42.88

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z =	= 30 ((Zn)															
66	96	0.28	0.00	0.03	0.00	0.308	0.000	-0.002	-0.006	-0.46	2.51	702.34	49.03			2.57	49.36
67	97	0.29		0.04	0.00	0.320	0.000	-0.012	-0.010	-0.93	2.23	701.70	57.75			2.30	58.14
68	98	0.28			-0.01			-0.028	-0.004	-0.91		703.08	64.44			2.25	64.95
69	99	0.30			-0.03			-0.062	0.004	-1.75		702.30	73.29			2.03	74.12
	100	0.28			-0.02			-0.053		-1.29		703.17	80.49			1.98	81.30
	101	0.27			-0.01				-0.007			701.79	89.94			1.67	90.73
	102103	0.25 0.21		0.06 0.03	-0.01 0.01			-0.047	-0.006 -0.016	-0.91 -0.47		702.43 700.70	97.37 107.18			1.65 1.37	98.29 108.06
	103			-0.03	0.01	0.117			-0.005	-0.13		701.33	114.61			1.02	115.63
75	105	0.11	0.00	-0.02	0.01	0.117	0.000	0.030	-0.007	-0.90	0.19	699.87	124.15			0.26	125.22
76	106	0.11	0.00	-0.02	0.02	0.117	0.000	0.030	-0.017	-1.62	-0.49	700.51	131.58			-0.33	132.87
77	107			-0.02	0.02	0.117			-0.017	-2.64	-1.43	699.01	141.15			-1.27	142.57
	108			-0.01	0.01	0.118			-0.008	-3.25	-1.95		149.03			-1.91	150.47
	109	0.09		0.00	0.01	0.096			-0.010		-3.13		158.63			-3.10	160.20
	110	0.05		0.01	0.00		0.000		-0.001		-3.89		166.55			-3.88	168.25
	111	0.04		0.01	0.00		0.000	-0.011			-5.36		176.10			-5.35	177.98
	112113	0.00		0.00 -0.01	0.00 0.00	0.000 0.032		0.000 0.012	0.000	-7.38 -6.85	-6.07		184.32 195.99			-6.07 -5.65	186.36 198.22
03	113	0.03	0.00	-0.01	0.00	0.032	0.000	0.012	0.000	-0.63	-3.00	092.00	193.99			-3.03	196.22
Z =	= 31 (
22	53			-0.03	0.06	0.106			-0.056	0.42		375.54	27.99			1.72	26.50
23	54			-0.02	0.05	0.183			-0.045	0.38		394.08	17.52			2.01	16.16
24 25	55 56	0.18		-0.02 0.00	0.05	0.194 0.195			-0.044 -0.029	-0.25 -0.27		415.01 432.21	4.66 -4.47			1.57 1.53	3.51 -5.48
26	57	0.16		0.00	0.03	0.193			-0.029 -0.019	-0.27 -0.67		451.22					-3.46 -16.23
27	58	0.13		0.00	0.01	0.172			-0.010	-0.73		467.25					-24.03
28	59	0.13		0.00	0.00	0.000		0.000	0.000	-0.73 -0.92		485.68					-24.03 -34.24
29	60		0.00		0.02	0.139			-0.016	-0.94		498.77					-39.13
30	61	0.16	0.00	-0.02	0.04	0.172	0.000	0.038	-0.035	-0.83	1.51	514.00	-45.90	-47.09	0.053		-46.15
31	62	0.18	0.00	0.00	0.03	0.195	0.000	0.016	-0.029	-0.39	1.72	526.22	-50.05	-52.00	0.028	1.71	-50.71
32	63	0.18	0.00	0.01	0.02	0.195	0.000	0.003	-0.021	0.10	2.25	539.72	-55.48	-56.55	0.001	2.25	-55.54
33	64	0.18		0.04	0.01		0.000	-0.034		0.45			-57.77		0.002		-57.77
34	65	0.18			-0.01		0.000	-0.047	0.000	0.74			-61.74		0.001		-61.66
35	66 67	-0.25				-0.256		0.029 0.015	0.052	0.53			-63.14		0.003		-62.99 -65.97
36		-0.24				-0.247			0.046	0.99			-66.19		0.001		
37 38		-0.20 -0.17		0.02		-0.207 -0.177			0.022 0.005	1.85 2.12			-66.55 -68.88		0.002 0.001		-66.33 -68.63
39		-0.17 -0.17		0.03		-0.177 -0.177			0.005	2.12			-68.54		0.001		-68.28
40		-0.20		0.03		-0.207			0.006	1.63			-70.33		0.001		-70.04
41	72	-0.20	0.00	0.04	0.01	-0.207	0.000	-0.030	-0.001	1.52	3.56	625.91	-69.03	-68.59	0.001		-68.73
42	73	-0.20	0.00	0.04	0.01	-0.207	0.000	-0.030	-0.001	1.15	3.19	634.86	-69.90	-69.70	0.002	3.23	-69.59
43	74	0.13	0.00	-0.02	0.01	0.139			-0.006	1.51	3.24	640.98	-67.95	-68.05	0.004		-67.67
44	75			-0.02	0.01	0.139			-0.006	0.71			-68.33		0.002		-68.04
45	76			-0.02	0.02	0.172			-0.015	-0.30			-66.15		0.002		-65.86
46	77		0.00	0.00	0.01	0.172				-1.02			-65.87		0.002		-65.61
47	78	0.14		0.00	0.01	0.150			-0.009				-63.33		0.002		-63.09
48 49	79 80	0.12 0.08		0.01 0.01	0.00 0.00		0.000		-0.001 -0.001				-62.47		0.098 0.123	-0.29 -1.35	-62.26
50	81		0.00		0.00	0.032		0.012					-57.96		0.123	-1.33 -2.13	
51	82	-0.10		0.00	-0.01			0.004				690.38		27.70	0.172		-52.61
52	83			-0.02	0.01	0.128			-0.007								-48.72
53	84			-0.02	0.02	0.139			-0.016								-43.02
54	85			-0.02	0.03	0.172			-0.025			700.74					-38.69
55	86			-0.01	0.03	0.183			-0.027			702.97					-32.87
56	87	0.18	0.00	0.00	0.04	0.195	0.000	0.017	-0.039	-0.81	1.12	706.64	-28.68			1.35	-28.37
57	88	0.18		0.01	0.03	0.195		0.004	-0.031	-0.24		707.84					-21.59
58	89	0.19		0.01	0.03	0.206			-0.031	0.12		710.95					-16.61
59	90	0.20	0.00	0.00	0.03	0.217	0.000	0.020	-0.028	0.55	2.68	711.87	-9.70			2.83	_9.47

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 31 (Ga)															
60	91		0.00	-0.05	0.02	0.304	0.000	0.099	0.003	-1.08	2.84	714.71	-4.47			3.12	-4.11
61	92			-0.04	0.02		0.000	0.086	-0.001	-0.93		715.70	2.61			3.02	2.90
62	93			-0.04	0.02		0.000	0.089	0.000	-0.90		718.06	8.32			3.25	8.66
63 64	94 95			-0.02 -0.01	0.02		0.000 0.000	0.067 0.054	-0.007 -0.011	-0.83 -0.61		718.54 720.65	15.91 21.88			3.22 3.24	16.17 22.16
65 66	96 97		0.00 0.00	0.02 0.03	0.00 -0.01		0.000 0.000	0.007 -0.006	-0.003 0.003	-0.05 0.01		720.86 722.65	29.73 36.01			3.08 3.06	29.94 36.29
67	98		0.00		-0.01			-0.018	0.000	-0.23		722.84	43.90			2.66	44.22
68	99		0.00		-0.02			-0.032	0.007	-0.39		724.27	50.54			2.67	51.00
69	100	0.27	0.00	0.06	-0.02	0.299	0.000	-0.044	0.003	-0.77	2.17	724.06	58.82			2.35	59.38
70	101		0.00	0.07	-0.02	0.299	0.000	-0.056	0.000	-0.89		725.18	65.77			2.31	66.48
	102		0.00		-0.01			-0.047		-0.82		724.57	74.46			1.93	75.14
	103 104		0.00 0.00	0.06 0.04	-0.01 0.00			-0.049 -0.030		-0.63 -0.53		725.39 724.26	81.71 90.90			1.78 1.56	82.50 91.66
	104		0.00	0.04	0.00			-0.030 -0.010		-0.50		724.26	98.38			1.26	99.20
	106			-0.01	0.01		0.000		-0.008	-0.54		723.88	107.43			0.69	108.33
	107		0.00		0.01		0.000		-0.008	-0.34 -1.13		724.43	114.94			0.09	115.95
	108		0.00		0.01		0.000			-2.16		723.57	123.88			-0.80	125.00
	109	0.11	0.00	0.00	0.01	0.118	0.000	0.005	-0.010	-2.91	-1.55	724.01	131.51			-1.52	132.75
79	110	0.11	0.00	0.01	0.00	0.118	0.000	-0.007	-0.001	-4.11	-2.68	723.05	140.54			-2.68	141.88
	111		0.00	0.02	-0.01			-0.023	0.009	-4.70	-3.57		148.28			-3.50	149.83
	112		0.00	0.01	0.00			-0.011	-0.000	-6.19	-5.00		157.26			-4.99	158.91
	113 114		0.00	0.00 -0.01	0.00		0.000 0.000	0.000 0.013	0.000 0.010		-5.73 -5.36		165.43 176.46			-5.73 -5.31	167.22 178.47
03	114	0.04	0.00	-0.01	-0.01	0.043	0.000	0.013	0.010	-0.50	-3.30	/19.41	170.40			-3.31	1/0.4/
Z :	= 32 ((Ge)															
23	55		0.00		0.04		0.000		-0.037	0.77		391.39	27.50			2.35	25.99
24	56		0.00	0.00	0.03		0.000		-0.029	0.20		413.43	13.53			1.96	12.21
25 26	57 58		0.00 0.00	0.01 0.02	0.02		0.000 0.000		-0.021 -0.003	0.13 -0.25		430.98 451.47	4.05 -8.37			1.86 1.34	2.90 -9.32
27	59		0.00	0.01	0.00			-0.004		-0.27		467.26					-16.88
28	60	0.07	0.00	0.00	0.00		0.000	0.002	0.000	-0.29		486.45				0.66	-27.83
29	61		0.00	-0.01	0.02		0.000			-0.36		500.08					-33.26
30	62	0.17	0.00	0.00	0.03	0.184	0.000	0.014	-0.029	-0.20	2.14	516.37	-40.99			2.15	-41.34
31	63		0.00	0.02	0.02			-0.009		0.19		529.45					-46.25
32	64		0.00	0.04	0.00			-0.033		0.46			-53.08		0.032		-53.23
33	65		0.00		-0.01			-0.046		0.69			-55.52		0.100		-55.59
34 35	66 67	-0.19 -0.27	0.00		-0.02	-0.208 -0.276		-0.059 0.023	0.007 0.063	0.89 0.49			-60.68 -62.30		0.030 0.005		-60.65 -62.19
36		-0.27				-0.276 -0.276		0.023	0.063	0.71			-66.58		0.005		-66.37
37		-0.23				-0.237		0.001	0.040	1.78			-66.94		0.001		-66.74
38	70	-0.21	0.00	0.03	-0.02	-0.218	0.000	-0.015	0.024	2.09	4.20	610.13	-70.18	-70.56	0.001	4.24	-69.94
39		-0.20		0.04		-0.207			0.008	2.21	4.03	618.33	-70.30	-69.91	0.001		-70.06
40		-0.21		0.04		-0.217			0.008	1.84			-72.86		0.002		-72.57
41		-0.22		0.05		-0.227			0.002	1.55			-71.88		0.002		-71.58
42		-0.23		0.05		-0.237			0.002	1.02			-73.72		0.002		-73.40
43	75 76		0.00	0.00	0.01		0.000		-0.009	1.43			-72.13		0.002		-71.85
44 45	70 77		0.00 0.00	-0.01 0.00	0.01		0.000 0.000		-0.007 -0.009	1.07 0.32			-73.04 -71.08		0.002 0.002		-72.75 -70.80
46	78		0.00	0.00	0.01			-0.0012		-0.57			-71.77		0.002		-71.49
47	79		0.00	0.02	0.00			-0.013		-1.34			-69.32		0.090		-69.06
48	80	0.13	0.00	0.02	0.00	0.140	0.000	-0.017	-0.003	-1.72	0.22	690.01	-69.34	-69.51	0.028	0.25	-69.10
49	81		0.00	0.02	0.00	0.129	0.000		-0.002						0.120		-66.06
50	82		0.00	0.00	0.00		0.000	0.000					-65.68	-65.62	0.244		-65.50
51	83		0.00	0.00	0.00	0.129		0.006				705.36					-60.30
52	84			-0.01	0.01	0.128			-0.008								-57.51
53 54	85			-0.01	0.02		0.000		-0.017			712.94					-51.71
54	86	0.10	0.00	-0.01	0.02	0.172	0.000	0.024	-0.017	-0.97	0.00	718.16	-49.00			0.93	-48.87

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	E ₆	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 32 ((Co)															
55	- 3 2 (87	0.17	0.00	0.00	0.03	0.184	0.000	0.014	-0.029	-0.69	1 18	720.39	_43 22			1 31	-42.98
56	88	0.17		0.00	0.03		0.000		-0.029 -0.031	-0.09 -0.28		724.63					-39.14
57	89	0.19		0.02	0.03		0.000		-0.033	0.03		726.22					-32.64
58	90	0.19		0.03	0.02		0.000		-0.025	0.50		730.07					-28.46
59	91	0.22		0.01	0.02		0.000		-0.021	0.64		731.24					-21.60
60	92	0.29	0.00	-0.05	0.02	0.316	0.000	0.102	0.004	-1.09	3 18	734.77	-17 24			3 48	-16.86
61	93			-0.04	0.02	0.327		0.092	0.002	-1.13			-10.30			3.37	-9.98
62	94			-0.03	0.02		0.000	0.079	-0.003	-0.72		738.98	-5.31			3.57	-5.00
63	95	0.30	0.00	-0.02	0.02	0.328	0.000	0.067	-0.007	-0.57		739.61	2.13			3.54	2.40
64	96	0.27	0.00	0.01	0.00	0.296	0.000	0.020	0.000	0.34	3.49	742.37	7.44			3.55	7.64
65	97	0.27	0.00	0.02	-0.01	0.296	0.000	0.006	0.007	0.14	3.31	742.80	15.08			3.37	15.29
66	98	0.27		0.04	-0.02	0.297	0.000	-0.020	0.010	0.17		745.33	20.62			3.37	20.95
67	99	0.27	0.00	0.05	-0.02	0.298	0.000	-0.032	0.007	-0.09	2.81	745.63	28.40			2.96	28.77
	100	0.27	0.00	0.06	-0.02	0.299	0.000	-0.044	0.003	-0.39		747.82	34.28			2.89	34.76
69	101	0.27	0.00	0.07	-0.02	0.299	0.000	-0.056	0.000	-0.85	2.31	747.69	42.48			2.58	43.06
	102	0.27			-0.03			-0.069	0.007	-1.02		749.62	48.62			2.48	49.41
	103	0.26			-0.02			-0.070		-1.18		749.07	57.24			2.15	58.04
	104	0.24			-0.02			-0.062	0.002	-0.72		750.45	63.93			2.04	64.75
	105	0.21			-0.01			-0.043		-0.43		749.30	73.15			1.87	73.87
	106	0.20			-0.01			-0.044		-0.63		750.62	79.91			1.55	80.73
	107	0.18		0.04	0.00					-0.96		749.66	88.94			0.99	89.79
	108	0.15		0.02	0.00			-0.015		-0.82		750.51	96.16			0.71	97.02
	109	0.11		0.02	0.00				-0.002			749.66	105.07			-0.20	106.04
	110 111	0.11 0.11		0.02 0.02	0.00					-2.34 -3.57	-0.98 -2.14	750.77	112.04 120.99			-0.95	113.12 122.19
																-2.11	
	112	0.09		0.02	-0.01			-0.021		-4.20		750.74	128.21			-2.86	129.57
	113 114	0.05 0.01		0.01 0.00	0.00		0.000	-0.011 0.000	-0.001 0.000	-5.56 -6.36	-4.38 -5.14	749.90	137.13 144.65			-4.37 -5.14	138.57 146.23
	115			-0.00	0.00		0.000	0.000	0.000	-5.89	-3.14 -4.72		155.70			-3.14 -4.71	157.44
	116			-0.01	0.00		0.000	0.013		-5.03			165.09			-3.87	166.98
	= 33 (
24	57		0.00		-0.01			-0.023	0.004	0.57		408.12	26.13			2.33	24.64
25	58		0.00		-0.02			-0.035	0.012	0.35		426.76	15.56			2.31	14.27
26 27	59 60		0.00 0.00		-0.02 -0.01			-0.048 -0.038	0.010	-0.14 -0.04		447.44 464.34	2.95 -5.88			1.85 1.99	1.87 -6.79
28	61		0.00	0.04	0.00			-0.038 -0.018		0.05		483.46					-0.79 -17.67
								-0.003									
29 30	62 63	0.14 0.17		0.01 0.02	0.01 0.01			-0.003 -0.011		0.25 0.37		498.48 515.52					-24.48 -33.32
31	64	0.17		0.02	0.00			-0.011		0.58		529.23					-38.85
32	65	0.19			-0.01			-0.046		0.72		544.71					-46.14
33	66	0.20			-0.02			-0.069	0.005	0.60			-50.01	-51.50	0.680		-50.63
34	67	0.20		0.08	-0.03			-0.082	0.012	0.65			-55.82		0.100		-55.87
35	68	-0.28				-0.287		0.014	0.065	0.29			-58.56		0.043		-58.55
36		-0.29				-0.297		0.017	0.065	0.36			-62.91		0.031		-62.79
37		-0.26				-0.267		0.008	0.048	1.41			-64.42		0.050		-64.29
38	71	-0.25	0.00	0.03	-0.04	-0.258	0.000	-0.006	0.042	1.63	4.41	615.08	-67.83	-67.89	0.004	4.45	-67.64
39	72	-0.25	0.00	0.03	-0.03	-0.258	0.000	-0.007	0.033	1.77	4.62	623.86	-68.55	-68.23	0.004	4.64	-68.34
40		-0.23				-0.238			0.018	1.77			-71.41		0.004		-71.17
41		-0.23		0.05		-0.238			0.011	1.60			-71.57		0.002		-71.31
42		-0.23		0.05		-0.238			0.011	1.31			-73.57		0.002		-73.28
43	76	-0.24	0.00	0.06	0.01	-0.248	0.000	-0.045	0.005	0.95	3.62	660.60	-73.00	-72.29	0.002	3.66	-72.71
44	77	0.16	0.00	0.02	-0.01	0.173	0.000	-0.014	0.007	1.38	3.52	669.60	-73.93	-73.92	0.002	3.54	-73.65
45	78	0.16		0.01	0.00			-0.001	-0.001	0.77			-72.86		0.010		-72.60
46	79	0.16		0.03	0.00			-0.025	-0.005	-0.27			-73.80		0.006		-73.52
47	80	0.16			-0.01			-0.026	0.005	-1.05			-72.24		0.023		-71.98
48	81	0.14			-0.01			-0.029		-1.57			-72.43		0.006		-72.17
49	82	0.12	0.00	0.02	-0.01	0.129	0.000	-0.019	0.007	-2.03	-0.22	706.30	-70.26	-70.32	0.200	-0.20	-70.03

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 33 ((Ac)															
50	- 33 (83	` ′	0.00	0.00	0.00	0.075	0.000	0.002	0.000	-2.00	-0.82	713.62	-69.52	-69.88	0.220	-0.82	-69.32
51	84		0.00	0.01	-0.01		0.000	-0.002	0.009	-1.99		717.55		07.00	0.220		-65.18
52	85	0.12	0.00	0.01	-0.01	0.129	0.000	-0.007	0.009	-1.30			-62.76				-62.57
53	86	0.14	0.00	0.01	0.00			-0.004		-0.81	1.14	726.12	-57.81			1.15	-57.64
54	87	0.16	0.00	0.01	0.01	0.173	0.000	-0.001	-0.011	-0.48	1.74	731.00	-54.61			1.78	-54.44
55	88	0.17	0.00	0.01	0.02	0.184	0.000	0.002	-0.021	-0.23	1.74	734.33	-49.87			1.80	-49.69
56	89		0.00	0.03	0.02		0.000		-0.025	-0.03		738.74					-45.99
57	90		0.00	0.04	0.01			-0.032		0.32		741.15					-40.36
58	91		0.00	0.04	0.01			-0.032		0.76		745.25					-36.38
59	92		0.00	0.05	0.00			-0.045		1.21		747.10					-30.17
60	93			-0.05	0.01		0.000	0.101	0.015	-0.88		750.86					-25.71
61 62	94 95			-0.04 -0.03	0.01		0.000 0.000	0.088 0.078	0.010 0.007	-0.68 -0.49		752.68 755.97					-19.53 -14.76
63	96			-0.03	0.01		0.000	0.073	-0.001	-0.27		757.25	-8.22			3.85	-8.04
64	97		0.00		-0.01		0.000	0.006	0.007	0.55		760.15	-3.05			3.90	-2.88
65	98	0.27	0.00		-0.02	0.297	0.000	-0.007	0.013	0.36	3.59	761.37	3.80			3.68	4.02
66	99		0.00		-0.02		0.000	-0.032	0.007	0.34		763.97	9.27			3.68	9.57
67	100	0.27	0.00	0.06	-0.04	0.298	0.000	-0.047	0.023	-0.11	2.95	765.13	16.18			3.29	16.70
68	101		0.00	0.07	-0.03	0.299	0.000	-0.057	0.010	-0.42	2.85	767.38	22.01			3.15	22.53
69	102	0.27	0.00	0.08	-0.03	0.300	0.000	-0.069	0.007	-0.94	2.41	768.02	29.44			2.77	30.06
70	103	0.25	0.00		-0.02	0.277	0.000	-0.060	0.001	-0.54	2.37	769.81	35.72			2.65	36.30
	104		0.00		-0.02			-0.072	-0.002	-1.04		770.08	43.52			2.30	44.22
	105		0.00		-0.02			-0.064	0.002	-0.59		771.48	50.19			2.24	50.90
	106		0.00		-0.02			-0.056	0.006	-0.44		771.12	58.63			2.06	59.34
	107		0.00		-0.01			-0.056		-0.56		772.43	65.39			1.78	66.17
	108		0.00		-0.01			-0.047	0.000	-0.84		772.09	73.79			1.24	74.58
	109 110		0.00 0.00	0.04	-0.01 0.00			-0.039	0.003 -0.002	-0.76 -1.29		773.08 772.73	80.88 89.30			0.93 0.06	81.71 90.13
	111		0.00	0.02	0.00				-0.002 -0.004			773.96	96.14			-0.71	90.13
	112	0.11		0.02	0.00				-0.002			773.68	104.49			-1.89	105.53
80	113		0.00	0.03	-0.01			-0.033		-4.09		774.65	111.59			-2.68	112.81
	114		0.00	0.03	0.00		0.000		-0.001	-5.38		774.38	119.93			-4.19	121.18
	115		0.00	0.00	0.00	0.011	0.000	0.000					127.34			-5.03	128.71
83	116	0.04	0.00	-0.01	0.00	0.043	0.000	0.013	0.001	-5.73	-4.59	772.65	137.81			-4.58	139.33
84	117	0.08	0.00	0.00	0.00	0.085	0.000	0.003	0.000	-4.87	-3.64	771.26	147.27			-3.64	148.93
85	118	0.10	0.00	0.00	0.00	0.107	0.000	0.004	0.000	-4.62	-3.29	768.70	157.90			-3.30	159.70
86	119	0.11	0.00	0.00	0.00	0.118	0.000	0.005	0.000	-3.79	-2.44	767.15	167.52			-2.45	169.48
Z :	= 34 ((Se)															
25	59		0.00	0.06	-0.04	0.219	0.000	-0.059	0.026	0.32	2.43	424.29	25.32			2.46	23.97
26	60		0.00		-0.04			-0.073	0.025	-0.19		446.05	11.62			2.05	10.49
27	61		0.00	0.05	-0.02			-0.051	0.011	0.14	2.07	463.26	2.49			2.07	1.48
28	62	-0.20	0.00	-0.02	-0.06	-0.204	0.000	0.043	0.051	-0.39	1.54	483.51	-9.69			1.60	-10.48
29	63	-0.20	0.00	-0.01	-0.06	-0.205	0.000	0.032	0.053	0.07	2.16	498.71	-16.82			2.19	-17.49
30	64	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	0.61	2.60	516.52	-26.55			2.60	-27.12
31	65	0.19	0.00	0.05	-0.01			-0.046	-0.000	0.79	3.07	530.51	-32.48				-32.93
32	66		0.00		-0.02			-0.069	0.005	0.72		547.09					-41.29
33	67		0.00		-0.03			-0.082	0.012	0.68			-45.84	54.00	0.022		-46.06
34	68	0.21			-0.04			-0.106	0.016	0.38			-53.19		0.033		-53.28
35		-0.30				-0.307		0.019	0.064	0.08			-56.20		0.034		-56.24
36 37		-0.30 -0.29				-0.307 -0.297		0.019 0.017	0.064 0.065	0.27 0.98			-61.61 -63.24		0.062 0.032		-61.54
38		-0.29 -0.29				-0.297 -0.298		0.017	0.065	1.07			-63.24 -67.69		0.032		-63.13 -67.50
39		-0.29 -0.27				-0.298 -0.278			0.039	1.63			-67.69 -68.61		0.012		-67.30 -68.42
		-0.23				-0.238			0.041	2.00			-72.31		0.002		-72.09
40 41		-0.23 -0.23				-0.238 -0.238			0.018	1.85			-72.51 -72.65		0.002		-72.09 -72.42
42		-0.23 -0.24		0.04		-0.238 -0.248			0.013	1.36			-75.60		0.002		-75.33
43		-0.25		0.05		-0.258			0.011	1.07			-75.28		0.002		-75.00

(MeV) (MeV) (MeV) (MeV) (MeV)	(MeV)	$E_{\rm mic}^{\rm FL}$ $M_{\rm th}^{\rm FL}$ (MeV) (MeV)
Z = 34 (Se)	(1110)	(Me v)
44 78 0.16 0.00 0.03 -0.01 0.173 0.000 -0.026 0.005 1.71 3.75 680.06 -77.10 -77.03	0.002	3.78 -76.83
45 79 0.16 0.00 0.03 -0.01 0.173 0.000 -0.026 0.005 1.71 3.73 000.00 77.10 77.05 45 79 0.16 0.00 0.03 -0.01 0.173 0.000 -0.026 0.005 1.06 3.25 687.25 -76.22 -75.92		3.28 -75.95
46 80 0.16 0.00 0.04 -0.01 0.174 0.000 -0.038 0.003 -0.01 2.39 697.14 -78.03 -77.76		2.43 -77.75
47 81 0.16 0.00 0.04 -0.01 0.174 0.000 -0.038 0.003 -0.85 1.63 703.86 -76.68 -76.39		1.67 - 76.41
48 82 0.14 0.00 0.05 -0.02 0.152 0.000 -0.053 0.012 -1.49 0.75 713.01 -77.76 -77.59		0.82 -77.46
		0.08 -75.44
49 83 0.12 0.00 0.03 -0.01 0.129 0.000 -0.031 0.006 -1.75 0.05 719.01 -75.68 -75.34 50 84 0.07 0.00 0.01 0.00 0.075 0.000 -0.010 -0.001 -1.72 -0.57 727.19 -75.80 -75.95		-0.56 - 75.59
51 85 0.12 0.00 0.01 0.00 0.01 0.00 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.000 0.010 0.010 0.000 0.010 0		-0.36 = 73.39 0.12 = -71.50
52 86 0.12 0.00 0.02 -0.01 0.129 0.000 -0.019 0.007 -1.57 0.09 751.17 -71.71 -72.45 52 86 0.12 0.00 0.02 0.00 0.129 0.000 -0.018 -0.002 -0.86 0.74 737.44 -69.91 -70.54		0.12 = 71.30 0.76 = 69.71
53 87 0.14 0.00 0.02 0.00 0.151 0.000 -0.016 -0.003 -0.35 1.53 740.69 -65.08 -66.58		1.56 -64.90
54 88 0.16 0.00 0.02 0.00 0.173 0.000 -0.013 -0.003 0.00 2.16 746.36 -62.69 -63.88	0.049	2.19 -62.51
55 89 0.18 0.00 0.03 0.01 0.196 0.000 -0.022 -0.015 0.07 2.27 749.73 -57.98		2.33 -57.78
56 90 0.19 0.00 0.05 0.01 0.208 0.000 -0.044 -0.020 0.21 2.62 755.09 -55.27 57 91 0.20 0.00 0.05 0.01 0.220 0.000 -0.042 -0.020 0.44 2.96 757.68 -49.79		2.75 -55.02
57 91 0.20 0.00 0.05 0.01 0.220 0.000 -0.042 -0.020 0.44 2.96 757.68 -49.79 58 92 0.20 0.00 0.05 0.00 0.219 0.000 -0.043 -0.010 0.88 3.38 762.43 -46.47		3.09 -49.56 3.49 -46.25
59 93 -0.28 0.00 -0.03 -0.06 -0.283 0.000 0.069 0.043 -0.08 3.39 764.85 -40.81		3.86 -40.25
60 94 0.31 0.00 -0.04 0.01 0.339 0.000 0.094 0.013 -1.11 3.74 769.15 -37.04		3.98 - 36.72
61 95 0.30 0.00 -0.03 0.00 0.328 0.000 0.077 0.018 -0.74 3.65 771.19 -31.02		3.83 - 30.75
62 96 0.31 0.00 -0.02 0.01 0.340 0.000 0.069 0.004 -0.55 3.72 775.28 -27.03		3.88 - 26.78
63 97 0.31 0.00 -0.01 0.01 0.340 0.000 0.056 0.000 -0.50 3.90 776.60 -20.28		4.01 -20.08
64 98 0.30 0.00 0.01 -0.01 0.330 0.000 0.026 0.011 -0.01 3.99 780.20 -15.81		4.10 -15.61
65 99 0.29 0.00 0.03 -0.02 0.319 0.000 -0.002 0.013 0.05 3.75 781.52 -9.06		3.86 - 8.84
$66\ 100 0.27\ 0.00 0.06\ -0.03 0.298\ 0.000\ -0.045 0.013 0.26 3.56\ 784.97\ -4.43$		3.82 -4.05
67 101 0.27 0.00 0.07 -0.04 0.299 0.000 -0.059 0.019 -0.28 3.01 786.18 2.42		3.39 2.94
68 102 0.27 0.00 0.08 -0.04 0.300 0.000 -0.071 0.016 -0.69 2.71 789.32 7.36		3.18 7.99
69 103 0.28 0.00 0.09 -0.04 0.312 0.000 -0.080 0.012 -1.42 2.28 790.04 14.70		2.79 15.42
70 104 0.27 0.00 0.09 -0.04 0.301 0.000 -0.083 0.013 -1.31 2.17 792.59 20.22		2.73 21.03
$71\ \ 105 \ 0.25\ \ 0.00 \ 0.09\ \ -0.03 \ 0.278\ \ 0.000 \ \ -0.085 \ 0.005 \ -1.32 \ 1.88\ \ 792.81 \ 28.08$		2.38 28.86
72 106 0.24 0.00 0.08 -0.03 0.266 0.000 -0.075 0.009 -0.92 1.86 794.89 34.07		2.31 34.85
73 107 0.22 0.00 0.09 -0.03 0.244 0.000 -0.091 0.008 -0.95 1.37 794.97 42.06		1.94 43.02
74 108 0.21 0.00 0.07 -0.02 0.231 0.000 -0.068 0.004 -0.54 1.47 796.58 48.53		1.81 49.33
75 109 0.19 0.00 0.07 -0.02 0.209 0.000 -0.071 0.005 -0.87 1.21 796.09 57.08		1.57 57.97
76 110 0.17 0.00 0.06 -0.02 0.186 0.000 -0.062 0.009 -0.84 0.92 797.74 63.50		1.23 64.40
77 111 0.15 0.00 0.05 -0.01 0.163 0.000 -0.051 0.002 -1.38 0.43 797.17 72.14		0.62 73.01
78 112		-0.24 79.26
79 113 0.11 0.00 0.03 -0.01 0.119 0.000 -0.032 0.006 -2.97 -1.52 798.81 86.64		-1.43 87.60
80 114 0.09 0.00 0.03 -0.01 0.097 0.000 -0.033 0.007 -3.66 -2.36 800.38 93.15		-2.26 94.21
81 115 0.05 0.00 0.01 0.00 0.053 0.000 -0.011 -0.001 -5.02 -3.84 800.22 101.38		-3.83 102.46
82 116 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -5.96 -4.75 801.57 108.10		-4.75 109.29
83 117 -0.03 0.00 0.00 0.00 -0.032 0.000 0.000 0.000 -5.34 -4.30 799.22 118.53		-4.30 119.84
84 118 0.02 0.00 0.00 0.00 0.021 0.000 0.000 0.000 -4.39 -3.41 798.48 127.34		-3.41 128.78
85 119 0.09 0.00 0.00 0.00 0.096 0.000 0.003 0.000 -4.09 -2.86 795.76 138.12		-2.86 139.71
86 120 0.10 0.00 0.00 0.00 0.107 0.000 0.004 0.000 -3.21 -1.98 794.77 147.19		-1.98 148.93
120 0120 0100 0100 0100 0100 0100 01000 01000		1.50 1.0.55
Z = 35 (Br)		
26 61 0.17 0.00 0.06 -0.04 0.185 0.000 -0.064 0.028 0.49 2.16 440.95 24.01		2.21 22.76
27 62 0.16 0.00 0.05 -0.03 0.174 0.000 -0.052 0.021 0.61 2.34 459.15 13.89		2.34 12.77
28 63 -0.27 0.00 -0.03 -0.07 -0.272 0.000 0.068 0.053 -0.73 1.43 480.01 1.10		1.50 0.20
29 64 -0.26 0.00 -0.01 -0.07 -0.264 0.000 0.044 0.058 -0.10 2.28 496.05 -6.87		2.30 - 7.66
30 65 -0.27 0.00 -0.01 -0.07 -0.275 0.000 0.046 0.058 0.02 3.13 513.68 -16.42		3.16 -17.06
31 66 -0.28 0.00 0.01 -0.07 -0.286 0.000 0.025 0.062 0.24 3.17 529.15 -23.82		3.17 - 24.36
32 67 -0.28 0.00 0.01 -0.07 -0.286 0.000 0.025 0.062 0.35 3.45 545.97 -32.58		3.47 - 32.98
33 68 -0.29 0.00 0.02 -0.07 -0.297 0.000 0.017 0.065 0.20 3.76 559.90 -38.44		3.75 - 38.76
34 69 -0.30 0.00 0.02 -0.07 -0.307 0.000 0.019 0.064 -0.02 3.81 575.69 -46.15		3.83 - 46.35
35 70 -0.32 0.00 0.02 -0.07 -0.327 0.000 0.024 0.063 -0.29 3.98 588.15 -50.53		3.97 - 51.12
36 71 -0.35 0.00 0.03 -0.08 -0.357 0.000 0.022 0.073 -0.81 4.04 602.32 -56.64 -57.06	0.568	4.08 - 56.66
37 72 -0.35 0.00 0.03 -0.08 -0.357 0.000 0.022 0.073 -0.35 4.47 613.03 -59.27 -59.01		4.49 - 59.26
38 73 0.33 0.00 0.04 -0.06 0.366 0.000 -0.09 0.049 0.03 4.66 625.58 -63.76 -63.63		4.71 -63.66
25 .2 5.65 5.65 5.65 5.65 5.65 5.65 5.65	3.031	1 03.00

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 35 ((R r)															
39	- 35 , 74	0.36	0.00	0.04	-0.04	0.401	0.000	0.002	0.029	-0.38	4.85	635.55	-65.66	-65.31	0.015	4.86	-65.56
40		-0.27				-0.278		-0.003	0.032	1.67			-69.44		0.014		-69.27
41		-0.27				-0.278			0.027	1.56			-70.62		0.009		-70.44
42 43		-0.26 -0.27		0.05		-0.268 -0.278			0.021 0.012	1.35 1.02			-73.79 -74.35		0.003 0.004		-73.56 -74.12
44		-0.27		0.05		-0.278			0.012	0.69			-76.33		0.002		-76.07
45	80	0.13			-0.01			-0.018	0.007	1.93			-76.48		0.002		-76.25
46	81		0.00		-0.01			-0.030	0.006	0.86			-78.46		0.002		-78.21
47	82		0.00		-0.01			-0.030	0.006	0.09			-77.91		0.002		-77.67
48	83	0.12			-0.01			-0.031	0.006	-0.75			-79.27		0.004		-79.03
49 50	84 85	-0.09	0.00	0.02	-0.01 0.00		0.000	-0.021 0.001	0.008 0.000	-1.16 -1.54			-78.13 -78.56		0.015 0.019		-77.91 -78.35
51		-0.09		0.00		-0.094			-0.000	-1.15			-75.40		0.013	-0.07	
52		-0.10		0.00	0.00	-0.105	0.000		-0.000	-0.29			-73.54		0.018	0.79	-73.35
53	88	0.12	0.00	0.02	0.00	0.129	0.000	-0.018	-0.002	0.30	1.75	752.25	-69.36	-70.73	0.038	1.77	-69.17
54	89		0.00	0.01	0.00		0.000		-0.001	0.44			-66.73		0.060		-66.56
55	90		0.00	0.02	0.00		0.000	-0.009		0.60			-62.89		0.077		-62.73
56 57	91 92		0.00	0.04 0.04	0.01			-0.026 -0.028		0.43 0.80			-60.32 -55.61		0.073 0.050		-60.11 -55.44
58	93		0.00	0.04	0.00			-0.028 -0.028		1.15		775.80		-30.38	0.030		-52.38
59	94			-0.03	0.00	0.317		0.075	0.017	-0.51		778.92					-47.38
60	95			-0.03	0.01		0.000	0.081	0.009	-1.00		783.70					-44.06
61	96			-0.02	0.00	0.340	0.000	0.068	0.014	-0.92		786.48					-38.83
62	97			-0.01	0.01		0.000	0.056				790.67					-34.95
63	98			-0.01	0.00		0.000	0.055	0.010	-0.60		792.78					-29.01
64	99		0.00		-0.01		0.000	0.026	0.011	-0.06		796.45					-24.61
	100 101		0.00 0.00		-0.02 -0.03		0.000	-0.002 -0.031	0.013 0.016	0.03		798.44 802.12					-18.51 -14.01
	101		0.00		-0.03			-0.031 -0.043	0.010	-0.36		803.80	-7.91			3.46	-7.59
	103		0.00		-0.04			-0.056		-0.75		807.08	-3.12			3.26	-2.62
69	104	0.29	0.00	0.09	-0.04	0.324	0.000	-0.078	0.011	-1.62	2.46	808.50	3.53			2.90	4.14
	105		0.00		-0.04			-0.080	0.012	-1.46		811.15	8.95			2.82	9.64
	106		0.00		-0.04			-0.083		-1.56		812.07	16.11			2.51	16.83
	107 108	0.25	0.00		-0.03 -0.04			-0.073 -0.075		-0.89 -0.90		814.05 814.61	22.20 29.71			2.57 2.34	22.86 30.51
	109		0.00		-0.03			-0.069		-0.13		816.37	36.02			2.26	36.78
	110		0.00		-0.03			-0.009 -0.058		-0.13 -0.51		816.56	43.91			1.92	44.66
		-0.15		0.06					-0.017			818.37	50.17			1.59	51.03
		-0.15		0.06	0.03				-0.017			818.72	57.88			0.81	58.81
	113		0.00	0.04	0.00				-0.005				64.27			-0.02	65.04
	114		0.00	0.02	0.00				-0.002				71.92			-1.27	72.68
	115 116		0.00	0.03	-0.01 0.00			-0.033	0.007 -0.000	-3.54			78.26 85.76			-2.14 -3.83	79.17 86.69
	117		0.00	0.00	0.00		0.000	-0.011 0.000		-6.15			92.30			-3.83 -4.88	93.32
		-0.03		0.00	0.00			0.000		-5.41			102.24			-4.32	103.38
84	119	0.01	0.00	0.00	0.00	0.011		0.000	0.000	-4.44	-3.43	822.11	111.00			-3.43	112.25
	120		0.00	0.00	0.00	0.064		0.002		-3.87			121.26				122.65
	121		0.00	0.00	0.00	0.096		0.003		-2.98			130.37				131.89
	122		0.00	0.02	0.00				-0.002				140.73				142.42
	123	0.11	0.00	0.01	0.00	0.118	0.000	-0.007	-0.001	-1.08	-0.34	013.40	147.77			-0.34	151.81
	= 36 (0 = : :										
27		-0.13				-0.135			0.011	1.12		456.83	23.50			2.19	22.26
28 29		-0.13 -0.14				-0.135 -0.146		0.007 -0.003	0.009	0.66 1.22		478.49 494.84	9.91 1.63			1.56 2.33	8.84 0.71
30		-0.14 -0.27				-0.140 -0.275		0.046	0.011	0.30		513.86	-9.32				-10.01
31		-0.27				-0.275		0.034	0.060	0.66		529.18					-17.17
32	68	-0.30	0.00	0.01	-0.07	-0.306	0.000	0.030	0.061	0.38	3.59	546.97	-26.29			3.65	-26.74

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 36 ((Kr)															
33		-0.32	0.00	0.02	-0.07	-0.327	0.000	0.024	0.063	0.06	3.92	561.11	-32.35			3.94	-32.74
34	70	-0.32	0.00			-0.327	0.000	0.024	0.063	-0.10		577.98					-41.40
35		-0.35 -0.36				-0.357	0.000	0.022	0.073	-0.74			-46.22 -53.76		0.652		-46.40
36 37		-0.36 -0.36				-0.366 -0.366	0.000 0.000	0.025 0.025	0.073 0.073	-0.91 -0.50			-55.76 -56.76		0.008 0.007		-53.81 -56.78
38	74		0.00		-0.05	0.401	0.000	0.001	0.039	-0.92			-62.38		0.002		-62.32
39	75	0.36			-0.04	0.402	0.000		0.024	-0.89			-64.63		0.008		-64.56
40	76	0.36			-0.05	0.403		-0.024	0.029	-0.71			-69.16		0.004		-68.99
41 42	77 78	0.32 -0.24		0.05	-0.04	0.355 -0.248		-0.022 -0.033	0.025 0.011	0.39 1.84			-70.48 -74.29		0.002 0.001		-70.32 -74.10
43		-0.25		0.06		-0.258		-0.043	0.006	1.46			-75.02		0.001		-74.81
44	80			0.05		-0.258 -0.268		-0.043 -0.029	0.000	1.02			-73.02 -78.28		0.004		-74.01 -78.03
45	81	0.12	0.00	0.02	-0.01	0.129	0.000	-0.019	0.007	2.25	3.41	703.97	-78.35	-77.69	0.002	3.42	-78.14
46	82	0.12			-0.01	0.129		-0.031	0.006	1.15			-81.21		0.002		-80.98
47	83		0.00		-0.01	0.129		-0.031	0.006	0.38			-80.82		0.003		-80.59
48 49	84 85	0.08	0.00	0.02	0.00	0.086 0.075		-0.021 -0.022	-0.002 -0.002	-0.27 -1.04			-83.14 -82.09		0.003 0.002		-82.92 -81.88
50	86	0.00		0.02	0.00	0.000	0.000	0.000	0.002	-1.76			-83.43		0.002		-83.23
51	87	-0.07	0.00	0.01	0.00	-0.073	0.000	-0.010	0.001	-1.12	-0.17	754.44	-80.40	-80.71	0.000	-0.16	-80.21
52	88	-0.10	0.00	0.00	0.00	-0.105	0.000	0.004	-0.000	-0.28	0.82	761.35	-79.24	-79.69	0.013	0.83	-79.05
53	89	0.12		0.02	0.00	0.129		-0.018		0.55			-75.12		0.052		-74.93
54 55	90 91		0.00 0.00	0.01 0.02	0.00	0.173 0.206		-0.001 -0.008		0.94 0.89			-73.38 -69.53		0.019 0.057		-73.20 -69.34
56	92		0.00	0.04	0.01	0.241		-0.026		0.69			-67.73		0.017		-67.51
57	93	0.22	0.00	0.05	0.00	0.242	0.000	-0.040	-0.011	0.99			-63.19		0.100	3.76	-62.98
58	94	0.28	0.00	-0.01	-0.01	0.306	0.000	0.046	0.018	0.17	3.99	791.39	-60.85			4.12	-60.62
59	95			-0.02	0.00	0.328	0.000	0.065	0.013	-0.70			-56.26				-56.05
60 61	96 97			-0.02 -0.01	0.00	0.340 0.340	0.000 0.000	0.068 0.055	0.014 0.010	-1.02 -0.96			-53.77 -48.64				-53.53 -48.46
62	98		0.00	0.00	0.00	0.352	0.000	0.045	0.006	-0.92		808.39					-45.37
63	99	0.31	0.00	0.01	-0.01	0.341	0.000	0.029	0.012	-0.65	3.55	810.86	-39.96			3.64	-39.80
	100		0.00		-0.02	0.342	0.000	0.015	0.017	-0.46		815.19					-36.01
	101		0.00		-0.02	0.331	0.000	0.000	0.013	-0.37		817.19					-29.97
	102 103		0.00 0.00		-0.03 -0.04	0.332 0.333		-0.026 -0.039		-0.48 -0.99		821.50	-26.39 -20.15				-26.10 -19.76
	104		0.00		-0.04	0.322		-0.054		-1.07		827.18					-15.46
	105		0.00		-0.04	0.322		-0.064		-1.79		828.62	-9.29			2.82	-8.79
	106		0.00		-0.04	0.324		-0.078		-1.73		831.90	-4.51			2.85	-3.87
	107		0.00		-0.04	0.312		-0.080		-1.73		832.83	2.64			2.60	3.30
	108		0.00		-0.04	0.300		-0.071		-1.13		835.49	8.05			2.73	8.72
	109 110	0.25 0.21			-0.04 -0.03	0.278 0.231		-0.087 -0.069	0.013	-0.97 0.13		835.97 838.35	15.64 21.33			2.67 2.55	16.45 22.01
		-0.15		0.06		-0.155		-0.060		0.36		838.65	29.10			2.18	29.79
		-0.15		0.06		-0.155			-0.017			841.15	34.68			1.78	35.44
		-0.12		0.06		-0.124			-0.019			841.79	42.10			0.80	42.95
		-0.12		0.06		-0.124			-0.019		-0.20		47.81 55.74			0.19	48.74
	115 116	0.09	0.00	0.03	0.00	0.097 0.053			-0.003 -0.001		-1.02 -2.01	844.30 846.70	55.74 61.41			-0.95 -2.00	56.42 62.11
	117		0.00	0.01	0.00	0.043			-0.000			847.42	68.75			-3.70	69.54
	118		0.00	0.00	0.00	0.000	0.000	0.000	0.000		-4.80		74.63			-4.80	75.51
		-0.03		0.01	0.00		0.000	-0.011	0.000				84.58			-4.18	85.56
	120		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.35	-3.34		92.69			-3.34	93.78
	121 122		0.00 0.00	0.00	0.00	0.043 0.064	0.000 0.000	0.001 0.002		-3.63 -2.58	-2.62	845.44 844.95	103.02 111.59			-2.62 -1.61	104.22 112.91
	123		0.05	0.00	0.00	0.086		0.002		-2.34			121.94			-1.01	123.48
	124		0.07	0.00	0.00	0.109	-0.096	0.006		-1.87							132.28

N	A	$arepsilon_2$	ϵ_3	\mathcal{E}_4	ϵ_6	eta_2	eta_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} FL (MeV)	$M_{ m th}^{ m FL}$ (MeV)
	= 37 ((Rh)															
29		-0.13	0.00	0.02	0.00	-0.136	0.000	-0.016	0.003	1.44	2.53	490.71	13.05			2.51	12.04
30	67	0.28	0.00	0.02	-0.01	0.308	0.000	0.009	0.007	0.69	3.07	509.91	1.92			3.00	1.01
31		-0.27				-0.277		0.021	0.045	1.21		526.04	-6.14			3.68	-6.87
32		-0.32				-0.327		0.024	0.063	0.60		544.11					-16.70
33		-0.34				-0.348		0.008	0.069	0.16		559.39					-23.84
34 35		-0.35 -0.36				-0.357 -0.366		0.022	0.073 0.073	-0.29 -0.59		576.48 590.57					-32.71 -38.68
36	73	-0.36 -0.36				-0.366		0.025	0.073	-0.39 -0.64		606.45					-38.08 -46.36
37	74	0.33			-0.06			-0.009	0.049	-0.55			-50.86	-51.92	0.004		-51.42
38	75	0.36	0.00	0.05	-0.05	0.402	0.000	-0.012	0.034	-1.47	3.90	633.83	-57.43	-57.22	0.007	3.91	-57.48
39	76	0.36	0.00	0.06	-0.05	0.403	0.000	-0.024	0.029	-1.58	3.90	645.13	-60.65	-60.48	0.002	3.89	-60.68
40	77	0.36			-0.04			-0.022	0.020	-1.36			-65.40		0.007		-65.34
41 42	78 79	0.33 0.32			-0.03			-0.018	0.015	-0.34			-67.45		0.007		-67.38
42	80	-0.32		0.03	-0.03 0.02			-0.020 -0.045	0.015 -0.004	0.16 1.75			-71.31 -72.70		0.006 0.007		-71.16 -72.55
44	81	-0.23		0.06	0.03	-0.237				1.52			-76.18		0.006		-75.99
45	82	0.23		0.00	0.00			-0.009		2.73			-77.30		0.003		-77.12
46	83	0.08	0.00	0.02	0.00			-0.021		1.67	2.45	721.26	-80.29	-79.07	0.006		-80.10
47	84	0.09		0.01	0.00			-0.009		0.89			-80.71		0.003		-80.51
48	85	0.06		0.01	0.00			-0.010		-0.08			-83.12		0.000		-82.92
49	86	0.07		0.02	0.00			-0.022		-1.09			-82.95		0.000		-82.75
50 51	87 88	-0.02 -0.07		0.01		-0.021 -0.073			0.000 -0.000	-1.82 -1.15			-84.43 -82.21		0.000 0.000		-84.24 -82.02
52		-0.07 -0.09		0.00		-0.073 -0.094			-0.000 -0.000	-0.19			-82.21 -81.17		0.005		-82.02 -80.99
53		-0.10		0.01		-0.105			0.001	0.81			-77.81		0.007		-77.63
54	91	-0.13	0.00	0.00	0.00	-0.135	0.000	0.007	-0.000	1.55	2.89	781.75	-76.21	-77.75	0.008	2.90	-76.04
55	92	0.22		0.02	0.01	0.240	0.000	-0.002	-0.013	0.77			-72.92		0.006	3.34	-72.74
56	93		0.00	0.03	0.01			-0.013		0.85			-71.33		0.008		-71.13
57 58	94 95		0.00	0.01 -0.01	0.00		0.000 0.000	0.017 0.048	0.000 0.019	0.57 -0.30			-67.62 -65.68		0.008 0.021		-67.46 -65.47
59 60	96 97			-0.01 -0.01	-0.01 0.00		0.000 0.000	0.051 0.055	0.019	-0.88 -1.14			-61.92 -59.54		0.029 0.031		-61.73 -59.35
61	98		0.00		-0.01		0.000	0.041		-1.21			-55.25		0.050		-55.10
62	99	0.32	0.00	0.00	0.00		0.000	0.045	0.006	-1.26	3.52	822.32	-52.21	-50.88	0.126	3.61	-52.05
63	100	0.32	0.00	0.01	-0.01	0.353	0.000	0.032	0.012	-1.25	3.45	825.47	-47.28			3.52	-47.15
	101		0.00		-0.01		0.000	0.019		-1.02				-43.60	0.166		-43.65
	102		0.00		-0.02		0.000	0.003		-0.95		832.86					-38.39
	103 104	0.31	0.00		-0.03 -0.03			-0.011 -0.035		-0.98 -1.44		837.04 839.51					-34.42 -28.80
	105		0.00		-0.04			-0.049		-1.69		843.45					-24.53
	106	0.30			-0.04			-0.064		-2.02		845.56					-18.53
70	107		0.00		-0.04			-0.064		-1.93		848.86					-13.70
	108		0.00		-0.04			-0.066		-1.83		850.38	-7.62			2.61	-7.13
	109		0.00		-0.04			-0.066		-1.48		853.07	-2.24			2.85	-1.69
	110		0.00		-0.04			-0.054		-1.22		853.94	4.95			2.89	5.48
	111		0.00		-0.04			-0.059		-0.56		856.43 857.61	10.54			2.97 2.39	11.15
		-0.15 -0.12		0.07 0.06		-0.154 -0.124				0.42 0.17		857.61 860.32	17.43 22.79			1.81	18.08 23.46
		-0.12		0.00					-0.019 -0.017			861.62	29.56			0.86	30.36
		-0.12		0.06					-0.010				35.29			0.19	36.02
79	116	0.05	0.00	0.01	0.00	0.053	0.000	-0.011	-0.001	-1.92	-0.96	864.77	42.55			-0.95	43.06
	117	0.04		0.01	0.00				-0.000				48.11			-2.00	48.69
	118		0.00	0.01	0.00				-0.000				54.82			-3.72	55.47
	119 120	-0.01	0.00	0.00 0.00	0.00 0.00		0.000	0.000 0.000		-6.20 -5.39			60.63 69.97			-4.83 -4.22	61.36 70.80
	121 122		0.00	0.00	0.00 0.00		0.000 0.000	0.000 0.000		-4.39 -3.64			78.11 87.77			-3.30 -2.65	79.04 88.80
		0.03	5.50	0.00	0.00	5.052	5.000	5.555	5.000	5.01	2.03	551.70	37.77			2.00	

	N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	\boldsymbol{z}	= 37 ((Rb)															
88 126 0.11 0.09 -0.01 0.00 0.001 0.121 -0.124 0.020 0.007 -1.86 0.08 86.34 14.73 0.05 0.01 1.02 0.03 1.02 0.007 -1.86 0.08 86.34 14.73 0.05 0.04 1.02 0.03 1.02 0.00 0.01 1.02 0.00 0.01 1.02 0.00		•		0.00	0.00	0.00	0.032	0.000	0.000	0.000	-2.46	-1.59	867.49	96.33			-1.60	97.48
					0.00	0.00			0.004	0.004				106.15			-0.92	107.56
90 128 0.25 0.00 0.005 0.01 0.273 0.000 0.006 0.010 -1.43 0.62 86.17 14.02 0.25 14.25 0.25 14.25 0.25 0.00 0.005 0.01 0.000 0.006 0.010 0.005 0.005 0.00																		116.32
1																		126.40 135.30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $																		146.25
10	91	120	0.23	0.00	-0.03	-0.01	0.273	0.000	0.090	0.031	-1.43	1.02	800.17	144.02			2.03	140.23
$\begin{array}{cccccccccccccccccccccccccccccccccccc$,					0.404		0.004	0.010	0.50		7 00 4 7	40.0=				
12 70 0.29 0.00 0.04 -0.03 0.320 0.000 -0.016 0.019 1.10 3.94 543.83 -8.55 3.92 -1.54 1.24 1.25																		9.95 1.52
33 7.1 -0.29 0.00 0.02 -0.07 -0.00 0.017 0.065 1.17 4.16 559.28 -15.94 4.28 -2 35 7.3 0.36 0.00 0.03 -0.03 0.400 0.000 0.016 0.024 -0.29 4.51 591.42 -31.94 4.07 -3.67 7.5 0.36 0.00 0.01 0.000 0.010 0.039 -0.95 4.51 591.42 -31.94 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 4.07 6.03 0.00<																		-9.26
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
16	34	72	-0.32	0.00	0.03	-0.08	-0.327	0.000	0.014	0.075	0.58	4.19	577.28	-25.87			4.28	-26.24
37 75 0.36 0.00 0.05 -0.05 0.402 0.000 -0.010 0.024 -1.85 3.47 638.26 -54.57 -54.24 0.037 3.50 -5 39 77 0.36 0.00 0.06 -0.03 0.000 -0.020 -1.99 3.40 649.82 -58.06 -57.80 0.009 3.40 40 78 0.36 0.00 0.06 -0.03 0.003 0.000 0.010 -1.47 3.81 63.55 -63.72 0.617 0.007 3.85 -64 2.00 0.06 -0.03 0.00 -0.020 0.010 -1.04 4.12 686.36 -70.39 -1.31 0.007 4.18 -7 -65.89 -66.48 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 3.00 -7.11 4.12 686.36 -70.39 -7.31 0.00 4.14 82 -7.26 -7.60 0.00 0.00 0.00 0.00	35	73	0.36	0.00	0.03	-0.03	0.400	0.000	0.016		-0.29							
188 76 0.36 0.00 0.05 -0.04 0.402 0.000 -0.012 0.022 -1.99 3.40 649.82 -58.06 -57.80 0.09 3.40 -5 40 78 0.36 0.00 0.06 -0.03 0.403 0.000 -0.020 0.010 -1.82 3.51 663.55 -63.17 60.17 0.007 3.83 -64 18 0.36 0.00 0.06 -0.03 0.403 0.000 -0.020 0.010 -1.44 4.12 686.36 -0.39 -70.31 0.00 4.18 3.20 0.00 0.00 0.00 4.18 57.71 1.71 4.18 2.71 -71.69 -71.53 0.00 4.48 8.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 4.48 68.71.69 -71.59 -71.50 0.00 3.23 -8.42 1.44 4.82 0.00 0.00 0.00 0.00 0.00 0.00 </td <td></td>																		
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
41 79 0.36 0.00 0.06 -0.03 0.403 0.000 -0.020 0.010 -1.47 3.81 673.80 -65.48 0.000 3.83 -64 42 80 0.36 0.00 0.06 -0.02 0.000 0.001 -1.04 4.12 686.36 -70.39 -70.31 0.00 4.48 4.7 4.8 81 0.00 0.00 0.00 0.000 0.00 0.00 3.6 3.75 708.35 -76.01 0.000 3.76 -74 4.8 8.3 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 3.75 717.64 -77.45 -76.01 0.00 3.29 -77.60 47.09 8.8 0.00 0.00 0.00 0.00 0.00 0.00 0.00 3.23 -77.95 8.8 8.1 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.53 3.82 -82 0.00																		
42 80 0.36 0.00 0.00 0.06 -0.03 0.403 0.000 -0.020 0.010 -1.04 4.12 686.36 -70.39 -70.31 0.007 4.18 -7 44 82 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 3.05 3.76 708.35 -76.23 -76.01 0.006 3.76 -7 45 83 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 2.63 3.29 717.64 -77.45 -76.09 0.010 3.29 -7 46 84 0.01 0.00 0.00 0.00 0.00 0.001 0.000 0.000 0.000 1.57 2.31 729.73 -81.47 -80.64 0.003 1.57 -8 48 86 0.00 0.00 0.01 0.00 0.000 0.000 0.000 0.000 0.000 1.57 2.31 729.73 -81.47 -80.64 0.003 1.57 -8 48 86 0.00 0.00 0.01 0.00 0.000 0.000 0.000 0.000 0.000 -0.50 0.45 749.95 -85.55 -84.52 0.001 0.45 -8 48 86 0.00 0.00 0.01 0.00 0.000 0.000 0.000 0.000 -0.50 0.45 749.95 -85.55 -84.52 0.001 0.45 -8 50 88 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -0.33 -0.24 757.95 -85.48 -84.88 0.001 0.02 0.05 51 89 -0.03 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.44 -0.46 774.35 -85.73 -86.21 0.001 -1.16 -8 52 90 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.44 -0.46 774.35 -85.73 -86.54 0.003 0.54 -8 53 91 0.02 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.44 -0.46 774.35 -85.73 -86.54 0.003 0.54 -8 53 93 0.22 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.03 -1.54 787.17 -82.41 -83.64 0.005 1.53 -8 54 92 -0.13 0.00 0.01 0.00 -0.135 0.000 -0.005 0.001 1.00 1.54 787.17 -82.41 -83.64 0.005 1.53 -8 55 93 0.22 0.00 0.01 0.01 0.029 0.000 0.000 0.000 1.00 1.54 787.17 -82.41 -83.64 0.005 1.53 -8 56 94 0.24 0.00 0.03 0.01 0.029 0.000 0.000 0.001 1.40 0.78 3.62 806.18 -77.21 -78.84 0.007 3.70 -7 57 95 0.28 0.00 0.00 0.00 0.03 0.00 0.000 0.010 0.010 0.01 0.88 3.26 788.98 -80.89 8.008 3.00 3.70 -7 58 96 0.28 0.00 0.00 0.00 0.00 0.00 0.000 0.044 0.016 -1.36 3.63 822.10 -68.91 -68.79 0.019 3.73 -66 61 99 0.32 0.00 0.00 0.00 0.03 3.30 0.00 0.010 0.010 0.01 -3.88 -72.56 -72.29 0.027 3.45 -66 61 90 0.32 0.00 0.00 0.00 0.03 3.30 0.00 0.0																		
44 82 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 3.76 76.23 -76.21 -76.01 0.006 3.76 -74 45 83 0.00 0.00 0.000	42	80	0.36	0.00	0.06	-0.03	0.403	0.000	-0.020		-1.04	4.12	686.36	-70.39	-70.31	0.007	4.18	-70.25
45																		
46 84 0.01 0.00 0.00 0.00 0.00 0.01 0.00 0.000 0.000 0.000 1.57 2.31 729.73 -814.7 -80.64 0.003 2.31 -84 785 -0.05 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.00 0.57 788.52 -82.18 -81.10 0.003 1.57 -84 88 60 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -0.50 0.45 749.95 -85.55 -84.52 0.001 0.45 -84 98 7 0.04 0.00 0.01 0.00 0.00 0.000 0.000 0.000 0.000 -1.33 -0.24 757.95 -85.48 -84.88 0.001 -0.24 -85 50 88 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.44 -0.46 774.35 -85.73 -86.21 0.001 -0.46 -88 52 90 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -1.44 -0.46 774.35 -85.73 -86.21 0.001 -0.46 -88 53 91 0.02 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 -0.25 0.54 782.21 -85.52 -85.94 0.003 0.54 -88 53 91 0.02 0.00 0.01 0.00 0.001 0.000 0.000 0.000 0.000 1.40 1.54 787.17 -82.41 -83.64 0.005 1.53 -85 55 93 0.22 0.00 0.01 0.01 0.02 0.035 0.000 0.000 0.000 1.00 1.54 787.17 -82.41 -83.64 0.005 1.53 -85 58 96 0.23 0.00 0.01 0.01 0.239 0.000 0.010 0.010 0.08 8 3.26 806.18 -77.21 -78.84 0.007 3.70 -75 58 96 0.31 0.00 0.00 0.00 0.03 0.01 0.263 0.000 0.010 -0.016 0.78 3.62 806.18 -77.21 -78.84 0.007 3.70 -75 59 97 0.32 0.00 0.00 0.00 0.03 0.00 0.000 0.010 -0.016 0.78 3.48 817.68 -72.56 -72.94 0.02 3.96 -75 59 97 0.32 0.00 0.00 0.00 0.351 0.000 0.044 0.016 -1.66 3.63 822.10 -68.91 -68.79 0.019 3.73 -66 61 99 0.32 0.00 0.00 0.00 0.352 0.000 0.045 0.006 -1.62 3.31 832.49 -63.16 -62.19 0.080 3.40 -66 61 00 0.32 0.00 0.01 0.00 0.355 0.000 0.045 0.006 -1.42 3.35 83.83 -60.92 -60.22 0.127 3.45 -66 61 10 0.33 0.00 0.02 0.00 0.355 0.000 0.035 0.000 0.02 -1.42 3.35 83.83 -60.92 -60.22 0.127 3.45 -66 61 10 0.33 0.00 0.00 0.00 0.03 0.355 0.000 0.004 0.000 0.014 1.31 3.13 82.49 -63.16 -62.19 0.080 3.30 -60 61 10 0.03 0.00 0.00 0.00 0.03 0.355 0.000 0.005 0.000 0.14 1.31 3.13 82.49 -63.16 -62.19 0.080 3.40 -60 61 10 0.03 0.00 0.00 0.00 0.03 0.355 0.000 0.005 0.000 0.14 1.31 3.13 82.49 -63.16 -62.19 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0																		
47 85 -0.05 0.00 0.01 0.00 -0.053 0.000 -0.011 0.001 0.73 1.57 738.52 -82.18 -81.10 0.003 1.57 -84 48 86 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.005 0.45 749.95 -85.55 -84.52 0.001 0.45 -84 9 87 0.04 0.00 0.01 0.00 0.004 0.000 0.000 -1.33 -0.24 757.95 -85.55 -84.52 0.001 0.45 -8 5																		
48 86 0.00 0.0																		
50 88 0.00 0.00 0.00 0.000 0.000 0.000 -2.36 -1.16 768.44 -87.89 -87.92 0.001 -1.16 -88 51 89 -0.03 0.00 0.00 0.000 0.000 0.000 0.000 -0.00 0.000 -0.00 0.000 -0.00 0.000 -0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 1.54 787.17 -82.41 -83.64 0.003 5.54 92 -0.13 0.00 0.00 0.000 0.000 0.001 1.40 2.70 794.20 -81.36 -82.87 0.003 2.72 -88 55 93 0.22 0.00 0.01 0.02 0.00 0.000 0.010 -0.016 0.78 3.62 806.18 -77.21 -78.84 0.007 3.70 -7 59 0.28 0.00 0.00 0.010 0.																		
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52 90 0.00 0.00 0.00 0.000 1.54 787.17 -82.41 -83.64 0.005 1.53 -8 54 92 -0.13 0.00 -0.015 0.000 -0.016 0.011 1.40 2.70 794.20 -81.36 -82.87 0.003 2.72 -8 55 93 0.22 0.00 0.01 0.010 -0.016 0.78 3.62 806.18 -77.21 -78.84 0.007 3.70 -75 95 0.28 0.00 0.02 0.00 0.308 0.00 0.010 -0.003 0.16 3.83 810.73 -73.68 -75.12 0.007 3.70 -75 95 0.28 0.00 0.001 0.032 0.00	50	88	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.36	-1.16	768.44	-87.89	-87.92	0.001		
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	64	102	0.32	0.00	0.02	0.00	0.353	0.000	0.021	-0.002	-1.27	3.33	846.88	-53.33	-53.08	0.111	3.43	-53.18
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	65	103	0.32	0.00	0.04	-0.01	0.355	0.000	-0.005	-0.000	-1.41	3.13	849.79	-48.18			3.22	-48.04
68 106 0.31 0.00 0.07 -0.04 0.345 0.000 -0.049 0.017 -1.89 2.58 861.90 -36.07 2.89 -3 69 107 0.31 0.00 0.08 -0.04 0.346 0.000 -0.061 0.013 -2.41 2.22 864.10 -30.20 2.56 -2 70 108 0.31 0.00 0.08 -0.04 0.346 0.000 -0.061 0.013 -2.28 2.30 868.01 -26.03 2.67 -2 71 109 0.31 0.00 0.08 -0.04 0.346 0.000 -0.061 0.013 -2.27 2.29 869.46 -19.42 2.64 -1 72 110 0.31 0.00 0.08 -0.04 0.346 0.000 -0.061 0.013 -1.91 2.52 872.79 -14.68 2.91 -1 73 111 0.31 0.00 0.07 -0.03 0.345 0.000 -0.047 0.007 -1.61 2.44 873.93 -7.75 2.69 - 74 112 -0.16																		
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75 113 -0.15 0.00 0.08 0.04 -0.154 0.000 -0.082 -0.022 0.09 1.76 878.49 3.84 2.28 76 114 -0.15 0.00 0.07 0.03 -0.154 0.000 -0.071 -0.015 -0.34 1.42 881.62 8.78 1.80																		-7.36
76 114 -0.15 0.00 0.07 0.03 -0.154 0.000 -0.071 -0.015 -0.34 1.42 881.62 8.78 1.80																		-2.16
																		4.57
$11 \ 113 \ 0.12 \ 0.00 \ 0.01 \ 0.03 \ 0.123 \ 0.000 \ 0.017 \ 0.017 \ -1.17 \ 0.33 \ 003.03 \ 13.72 \ 0.74 \ 1$																		9.42 16.12
																		21.15
																		28.20

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 38 ((Sr)															
	118		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.06	-2.09	890.01	32.67			-2.09	33.14
	119		0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-5.01	-3.78		39.35			-3.77	39.89
	120		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.34		894.36	44.47			-4.97	45.08
	121 122	-0.02	0.00 0.00	0.00	0.00 0.00	-0.021 0.000	0.000 0.000	0.000	0.000 0.000	-5.47 -4.49		893.05 893.63	53.85			-4.27 -3.39	54.54 62.12
				0.00				0.000					61.34				
	123 124		0.00 0.00	0.00	0.00 0.00	0.011	0.000 0.000	0.000 0.000	0.000 0.000	-3.64 -2.46		892.01 892.11	71.03 79.00			-2.66 -1.62	71.91 79.98
	125		0.00	0.00	0.00	0.055	-0.095	0.003	0.003	-2.40 -2.39		890.32	88.86			-0.84	90.10
	126		0.09		0.00		-0.123	0.017	0.007	-1.95		890.38	96.88			0.09	98.35
89	127	0.10	0.10	-0.02	0.00	0.111	-0.138	0.032	0.010	-1.90	0.25	888.52	106.81			0.60	108.49
90	128	0.10	0.10	-0.02	0.01	0.111	-0.137	0.032	-0.000	-1.02	0.96	888.38	115.02			1.33	116.83
	129			-0.05	-0.01	0.261	0.000	0.087	0.030	-1.07		885.63	125.84			2.46	127.85
	130			-0.05	-0.01	0.284	0.000	0.092	0.032	-1.38		886.06	133.48			2.40	135.68
93	131	0.27	0.00	-0.05	0.00	0.294	0.000	0.095	0.023	-1.82	1.70	884.36	143.26			2.05	145.48
Z :	= 39 ((Y)															
31	70	0.36			-0.01	0.400	0.000	0.020	0.005	-0.11		520.89	13.59			3.31	12.56
32	71		0.00		-0.02	0.401	0.000	0.006	0.010	-0.01		540.02	2.53			3.78	1.68
33 34	72 73		0.00 0.00		-0.03 -0.04	0.401 0.402	0.000	0.004 -0.010	0.019 0.024	0.19 -0.12		556.15 574.51	-5.53			4.28 4.22	-6.28 -16.40
35	74		0.00		-0.04	0.401	0.000	0.002	0.024	-0.12 -0.37			-23.06				-23.58
36	75		0.00		-0.04	0.402		-0.010	0.024	-0.98			-32.46				-32.83
37	76		0.00		-0.04	0.403		-0.022	0.020	-1.48		621.78					-39.20
38	77	0.36	0.00	0.07	-0.03	0.404	0.000	-0.032	0.006	-2.05	3.22	638.12	-47.14				-47.35
39	78		0.00	0.07		0.404		-0.032	0.006	-2.26			-51.94				-52.49
40	79		0.00		-0.03	0.417		-0.041	0.001	-2.45	3.23		-58.21		0.450		
41	80		0.00		-0.02	0.429		-0.036	-0.009	-2.28			-61.19		0.177		-61.24
42 43	81 82		0.00 0.00	0.07 0.07	-0.02 -0.02	0.404 0.404		-0.031 -0.031	-0.004 -0.004	-1.42 -1.08			-65.96 -68.14		0.062 0.103		-65.92 -68.09
44	83		0.00	0.07	0.02	0.000	0.000	0.000	-0.004	2.92			-08.14 -72.67		0.103		-08.09 -72.58
45	84		0.00	0.00	0.00	0.000	0.000	0.000	0.000	2.51			-74.75		0.091		-74.64
46	85	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	1.45	2.21	734.51	-78.96	-77.84	0.019	2.21	-78.83
47	86	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	0.74	1.53		-80.46		0.014		-80.31
48	87	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.63			-84.06		0.002	0.35	-83.90
49	88	0.03		0.01	0.00	0.032	0.000		-0.000				-84.80		0.002		-84.64
50	89	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-2.48			-87.40		0.003		-87.24
51	90	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000	-1.54			-86.03		0.003		-85.87
52 53	91 92	0.00 0.00		0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-0.34 0.95			-85.96 -83.63		0.003		-85.80 -83.48
54	93	-0.14		0.00	0.00		0.000	-0.004	0.000	1.30			-82.60		0.009		-82.44
55	94	0.20		0.00	0.01	0.217	0.000		-0.009	1.18			-80.05		0.007		-79.89
56	95	0.26	0.00	0.03	0.01	0.286	0.000	-0.006	-0.016	0.49	3.64	815.66	-79.40	-81.21	0.007	3.71	-79.22
57	96	0.28		0.02	0.01	0.308	0.000		-0.013	0.15			-76.65		0.023	3.89	-76.50
58	97		0.00	0.01	0.00	0.341	0.000	0.030	0.002	-0.68			-75.68		0.012		-75.51
59	98	0.32		0.01	0.00	0.353	0.000	0.033		-1.23			-72.77		0.025		-72.63
60	99		0.00	0.01	0.00	0.364	0.000	0.036		-1.69			-71.41		0.024		-71.25
	100		0.00	0.01	0.01	0.376	0.000		-0.006				-67.89		0.079		-67.76
	101 102		0.00 0.00	0.02	0.01	0.376 0.376	0.000		-0.011 -0.011				-65.81 -61.74		0.095 0.086		-65.67 -61.63
	102		0.00	0.02	0.01	0.376	0.000		-0.011				-59.09	-01.09	0.080		-58.97
	104		0.00		-0.01	0.366			-0.000				-54.60				-54.51
	105		0.00		-0.02	0.355		-0.019		-1.57			-51.56				-51.42
	106		0.00		-0.02	0.356		-0.031		-2.00			-46.72				-46.57
	107		0.00		-0.03	0.358		-0.057		-2.35			-43.36				-43.08
	108		0.00		-0.04	0.359		-0.070		-2.95			-38.22				-37.86
70	109		0.00		-0.04	0.359		-0.070		-2.84			-34.17				-33.77
	110		0.00		-0.03	0.370		-0.054		-2.78			-28.06				-27.77
	111	0.32	0.00	0.08	-0.03	0.358	0.000	-0.057	0.003	-2.22	2.60	888.83	-23.42			2.86	-23.08

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
- Z	= 39 ((Y)															
	112	0.32	0.00	0.07	-0.03	0.357	0.000	-0.045	0.007	-1.93	2.73	890.41	-16.93			2.94	-16.63
		-0.16		0.07		-0.165		-0.069		0.98		893.66					-11.73
75	114	-0.16	0.00	0.07	0.03	-0.165		-0.070		0.14		895.62	-6.00			2.44	-5.53
		-0.15		0.07		-0.154		-0.071		-0.40		899.14	-1.45			1.81	-0.92
77	116	-0.15	0.00	0.07	0.04	-0.154	0.000	-0.071	-0.024	-1.45	0.41	901.17	4.59			0.85	5.25
78		-0.12		0.06		-0.124	0.000	-0.063		-1.64		904.28	9.55			0.13	10.14
79	118	-0.12		0.05	0.03	-0.124	0.000	-0.052	-0.021	-2.67		905.98	15.93			-0.98	16.51
	119		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.98		908.92	21.06			-2.04	21.42
	120 121		0.00 0.00	0.01	0.00	0.021 0.000	0.000 0.000	-0.012 0.000	-0.000 0.000	-4.95 -6.33		910.92 913.98	27.13 32.14			-3.72 -4.96	27.57 32.63
	122	-0.01	0.00	0.00	0.00	-0.011	0.000 0.000	0.000	0.000	-5.41 -4.42		913.23	40.96			-4.22	41.53
	123 124		0.00	0.00	0.00	0.000 0.011	0.000	0.000 0.000	0.000 0.000	-4.42 -3.53		913.85 912.75	48.41 57.58			-3.33 -2.54	49.05 58.31
	125		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.35		912.94	65.46			-1.52	66.28
	126		0.07		0.00		-0.095	0.014	0.004	-2.27		911.75	74.72			-0.77	75.79
88	127	0.04	0.09	-0.01	0.01	0.046	-0.122	0.016	-0.004	-1.75	-0.13	911.87	82.68			0.13	83.95
	128			-0.01	0.01		-0.149	0.017	-0.001	-1.74		910.60	92.02			0.64	93.51
90	129	0.04	0.12	-0.01	0.02	0.048	-0.162	0.018	-0.010	-1.09	1.01	910.50	100.19			1.49	101.92
	130			-0.03	0.01		-0.180	0.046	0.006	-1.42		909.01	109.75			1.93	111.68
92	131	0.25	0.00	-0.05	0.00	0.272	0.000	0.090	0.020	-1.16	2.05	908.69	118.14			2.38	119.96
	132			-0.05	0.00	0.283	0.000	0.092	0.022	-1.68		907.61	127.29			2.06	129.24
	133			-0.04	0.00	0.283	0.000	0.080		-1.24		907.52	135.46			2.17	137.46
95	134	0.27	0.00	-0.04	0.01	0.294	0.000	0.083	0.008	-1.57	1.76	906.09	144.95			1.92	147.05
\boldsymbol{z}	= 40 ((Zr)															
32	72	-0.24	0.00	0.04	-0.01	-0.248	0.000	-0.022	0.018	1.70	3.57	538.66	11.18			3.55	10.36
33	73	-0.26	0.00	0.05	-0.01	-0.268	0.000	-0.028	0.021	1.63	4.00	555.07	2.85			3.97	2.12
34	74		0.00		-0.03	0.403		-0.020	0.010	0.15		574.01	-8.03			4.19	-8.67
35	75		0.00		-0.03	0.402		-0.008	0.015	-0.03		589.49					-16.00
36	76		0.00		-0.03	0.404		-0.032	0.006	-0.74		607.88					-26.17
37	77		0.00		-0.03	0.404		-0.032	0.006	-1.22		622.53					-32.69
38	78		0.00		-0.03	0.417		-0.041	0.001	-2.05		639.75					-41.72
39 40	79 80		0.00 0.00		-0.03 -0.02	0.417 0.430		-0.041 -0.047	0.001 -0.014	-2.31		653.22	-46.88 -54.44	55 50	1.490		-47.08 -54.53
41	81		0.00		-0.02 -0.02	0.430		-0.047 -0.044						-58.49			-54.55 -57.70
			0.00			0.443								50.17	0.107		-63.20
42 43	82 83			0.09	-0.01	-0.234		-0.042 -0.092		-2.08 0.76		693.79 704.55	-65.23	-66 46	0.096		-65.20 -65.87
44		-0.23		0.09		-0.235		-0.081		0.49		718.07		00.10	0.070		-71.26
45		-0.01		0.00		-0.011	0.000	0.000	0.000	2.32			-73.58	-73.15	0.101		-73.49
46	86	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	1.24	1.98	741.48	-78.65	-77.80	0.030	1.98	-78.54
47	87	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	0.53	1.27	751.25	-80.34	-79.35	0.008	1.27	-80.22
48	88	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-0.84	0.10	763.75	-84.76	-83.62	0.010	0.10	-84.63
49	89	0.03		0.01	0.00	0.032	0.000	-0.012	-0.000	-1.80			-85.78		0.004		-85.64
50	90	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-2.80			-89.15		0.002		-89.01
51	91	-0.02		0.00	0.00		0.000	0.000	0.000	-1.84			-87.92		0.002	-0.85	-87.77
52	92		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.69			-88.69		0.002		-88.55
53	93		0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.65			-86.46		0.002		-86.32
54 55	94	-0.15		0.01		-0.156	0.000	-0.003	-0.008	0.95			-86.08		0.002		-85.93
55 56	95 96	-0.17 0.22		0.01 0.01	0.00	-0.176 0.240	0.000 0.000	-0.000	0.001 -0.021	1.35 1.13			-83.87 -83.91		0.002 0.003		-83.73 -83.74
									-0.021 -0.013								
57 58	97 98		0.00 0.00	0.02	0.01	0.296 0.342	0.000 0.000		-0.013 -0.002	0.50 -0.37			-81.09 -80.72		0.003 0.020		-80.93 -80.54
59	99		0.00	0.02	0.00	0.342	0.000	0.018	0.002	-0.97			-30.72 -77.85		0.020		-30.54 -77.69
	100		0.00	0.01	0.01	0.364	0.000		-0.002				-77.24		0.036		-77.06
	101		0.00	0.02	0.01	0.376	0.000		-0.011				-73.89		0.031		-73.74
	102		0.00	0.02	0.01	0.376	0.000		-0.011		3.44	864.51	-72.53	-71.74	0.051		-72.37
	103		0.00	0.03	0.01	0.377	0.000		-0.015				-68.58		0.109		-68.44
64	104	0.34	0.00	0.04	0.00	0.378	0.000	0.003	-0.010	-1.64	3.38	874.78	-66.66			3.51	-66.51

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 40 ((Zr)															
	105		0.00	0.05	-0.01	0.367	0.000	-0.014	-0.004	-1.57	3.22	878.47	-62.28			3.33	-62.16
	106		0.00		-0.01	0.368		-0.026		-1.62	3.21		-59.90				-59.73
	107		0.00		-0.02	0.357		-0.043		-1.89			-55.20				-55.02
	108 109		0.00 0.00		-0.03 -0.03	0.358 0.359		-0.057 -0.068	0.003 -0.001	-2.13 -2.76	2.78		-52.46 -47.42				-52.19 -47.12
	110		0.00		-0.03	0.359		-0.068		-2.65			-44.04				-43.70
	111		0.00	0.09	-0.03	0.371		-0.066		-2.79		902.73					-37.79
	112		0.00		-0.03	0.359	0.000	-0.068		-2.18	2.77		-34.08				-33.71
	113	0.33		0.08	-0.03	0.370		-0.054	0.003	-2.01	2.83		-27.75				-27.44
	114	-0.18		0.07	0.03	-0.185		-0.067		0.52			-23.94				-23.57
		-0.16 -0.16		$0.08 \\ 0.08$		-0.164 -0.164		-0.081 -0.081		-0.34 -0.95			-18.29 -14.03				-17.75 -13.43
		-0.16 -0.15		0.08		-0.164 -0.154		-0.081 -0.082		-0.93 -1.90		919.01	-8.02			0.66	-7.38
		-0.15		0.07		-0.154		-0.071		-2.27	-0.31		-3.56			0.05	-3.01
79	119	-0.12	0.00	0.06	0.03	-0.124	0.000	-0.063	-0.019	-3.04	-1.48	926.56	2.63			-1.16	3.18
	120	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-3.18		930.08	7.19			-2.22	7.47
	121 122		0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-5.16		932.16	13.18			-3.92	13.52
	122	-0.00	0.00	0.00	0.00	0.000 -0.021	0.000 0.000	0.000	0.000 0.000	-6.57 -5.63		935.85 935.14	17.56 26.34			-5.19 -4.41	17.95 26.80
	123	0.02		0.00	0.00	0.000	0.000	0.000	0.000	-4.62		936.34	33.21			-3.51	33.74
	125		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-3.69		935.25	42.37			-2.67	42.97
	126		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.50		936.01	49.69			-1.64	50.37
	127		0.05	0.00	0.00	0.022	-0.067	0.001	0.002	-2.00		934.76	59.00			-0.86	59.84
	128		0.09	-0.01	0.01		-0.122	0.015	-0.004	-1.78		935.46	66.37			0.10	67.49
	129			-0.01	0.01		-0.149	0.017	-0.001	-1.74		934.22	75.68			0.64	77.01
	130 131			-0.01 -0.02	0.02	0.038	-0.162 -0.178	0.018 0.031	-0.010 0.003	-1.10 -0.91		934.69 933.05	83.29 93.00			1.49 2.09	84.84 94.71
	132			-0.02	0.00	0.049	0.000	0.101	0.003	-0.91 -1.08		933.39	100.73			2.59	102.48
93	133			-0.05	0.00	0.272	0.000	0.090	0.020	-1.28	1.96	932.23	109.96			2.28	111.70
94	134	0.26	0.00	-0.04	0.00	0.283	0.000	0.080	0.018	-1.02	2.18	932.66	117.60			2.42	119.40
	135			-0.03	0.01	0.305	0.000	0.073	0.005	-1.35		931.20	127.13			2.17	128.94
	136 137	0.28		-0.02 -0.01	0.01 0.01	0.305 0.317	0.000 0.000	0.060 0.051	0.002 -0.001	-1.03		931.44 929.88	134.97 144.60			2.28 1.96	136.88 146.59
			0.00	-0.01	0.01	0.317	0.000	0.031	-0.001	-1.41	1.97	929.00	144.00			1.90	140.39
	= 41 (
33		-0.26 -0.26		0.06		-0.268 -0.269		-0.040	0.015 0.024	1.39		550.96	14.24 3.22			3.85	13.44
34 35	76		0.00		-0.01 -0.03	-0.209 0.402		-0.039 -0.008	0.024	1.53 0.35		570.05 586.27	-4.93			4.18 4.40	2.56 -5.59
36	77		0.00		-0.02	0.426		-0.012	0.001	-0.58			-15.33				-15.88
37	78	0.38	0.00	0.07	-0.03	0.427	0.000	-0.026	0.005	-1.09	4.05	620.28	-22.79			3.93	-23.27
38	79		0.00	0.07	-0.02	0.428	0.000	-0.024	-0.004	-1.78			-32.17			3.49	-32.53
39	80	0.39			-0.02	0.441			-0.009	-2.37			-38.48				-38.80
40 41	81 82		0.00 0.00	0.09	-0.01 0.00	0.455 0.467			-0.023 -0.033	-2.71 -2.85			-46.27 -50.83				-46.47 -51.37
42				0.10		-0.234		-0.032 -0.092		-2.63			-50.83 -57.21	-58.96	0.315		-57.25
43		-0.23		0.10		-0.234		-0.092		0.33			-60.96				-60.97
44		-0.23		0.10		-0.234			-0.019	-0.08			-66.56	-67.15	0.224		-66.50
45		-0.23	0.00	0.09	0.05	-0.235	0.000	-0.081	-0.022	-0.21	2.76	731.57	-69.52	-69.83	0.085	2.77	-69.45
46	87	0.01		0.00	0.00		-0.013	0.000	0.000	1.22			-74.60		0.061		-74.52
47	88	0.01		0.00	0.00		-0.013	0.000	0.000	0.52			-77.11		0.101		-77.02
48 49	89 90	0.01 0.03		0.00	0.00		-0.013 -0.014	0.000	0.000 0.000	-0.86 -1.77			-81.70 -83.48		0.027 0.005		-81.59 -83.36
50	90	0.03		0.00	0.00		-0.014 -0.013	0.000	0.000	-1.77 -2.87			-83.48 -87.09		0.003		-85.36 -86.96
51	92		0.01	-0.01	0.00		-0.013	0.012	0.000	-1.91			-86.59		0.003		-86.46
52	93	0.01	0.01	0.00	0.00	0.011	-0.013	0.000	0.000	-0.73	0.06	806.13	-87.57	-87.21	0.002	0.06	-87.44
53	94	0.02	0.01	0.00	0.00	0.021	-0.014	0.000	0.000	0.61	1.13	812.74	-86.12	-86.36	0.002	1.13	-85.99
54	95	-0.17		0.02	0.01		0.000		-0.006	0.51			-86.16		0.002		-86.02
55	96	0.16	0.00	-0.02	0.01	0.172	0.000	0.036	-0.005	1.08	2.91	827.26	-84.49	-85.60	0.004	2.93	-84.36

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	$\sigma_{\rm exp}$ (MeV)	E _{mic} (MeV)	M _{th} ^{FL} (MeV)
Z:	= 41 ((Nb)															
56	97	. ,	0.00	0.01	0.02	0.240	0.000	0.011	-0.021	0.90	3.38	835.41	-84.57	-85.61	0.003	3.42	-84.42
57	98		0.00	0.01	0.02	0.262	0.000		-0.020	0.95			-82.59		0.006		-82.46
58	99		0.00	0.01	0.01	0.296	0.000		-0.010	0.57			-82.41		0.013		-82.27
	100 101		0.00 0.00	0.03	0.01 0.02	0.412 0.400	0.000 0.000		-0.014 -0.019	-1.92			-79.82 -79.40		0.026 0.019		-79.67 -79.22
													-76.83				
	102 103		0.00 0.00	0.02	0.02	0.400 0.388	0.000 0.000		-0.019 -0.020	-2.12 -1.78			-76.83 -75.59		0.041 0.068		-76.69 -75.44
	103		0.00	0.02	0.02	0.389	0.000		-0.024				-72.36		0.105		-72.24
	105		0.00	0.04	0.01	0.390	0.000	0.008	-0.019	-1.60			-70.48		0.100		-70.35
65	106	0.34	0.00	0.05	0.00	0.379	0.000	-0.009	-0.014	-1.57	3.65	890.12	-66.64			3.73	-66.56
	107		0.00	0.06	-0.01	0.380				-1.55			-64.37				-64.25
	108		0.00		-0.02	0.333		-0.036		-0.95			-60.38				-60.28
	109 110		0.00 0.00		-0.02 -0.03	0.334 0.335		-0.048 -0.062	-0.002	-1.19 -1.82			-57.79 -53.40				-57.64 -53.21
	111		0.00		-0.03	0.336		-0.002 -0.074		-1.82 -1.93			-50.20				-33.21 -49.93
	112		0.00		-0.03	0.323		-0.064	0.001	-1.54			-45.01				-44.78
	113		0.00	0.08	-0.03	0.323		-0.067	0.003	-0.98			-43.01 -41.18				-40.91
		-0.21		0.07		-0.217		-0.062		0.38			-35.67				-35.46
		-0.19		0.08		-0.195			-0.010	0.04			-32.10				-31.75
75	116	-0.18	0.00	0.08	0.04	-0.184	0.000	-0.078	-0.020	-0.60	1.45	931.11	-26.91			1.84	-26.48
		-0.16		0.08		-0.164			-0.021	-1.06			-23.05				-22.55
		-0.16		0.07		-0.164			-0.023				-17.28				-16.80
		-0.15 -0.15		0.07 0.07		-0.154 -0.154			-0.015 -0.015	-2.37 -3.42		941.37	-12.96 -7.25			-1.03	-12.51 -6.76
	121	0.01		0.00	0.00		-0.013	0.000	0.000	-3.09	-2.11		-2.78			-2.11	-2.58
	122		0.01	0.01	0.00		-0.013		-0.000	-5.09		950.08	2.55			-3.86	2.80
	123		0.01		0.00		-0.014	0.012	0.000	-6.54		953.82	6.87			-5.11	7.18
83	124	-0.02	0.00	-0.01	0.00	-0.021	0.000	0.012	-0.000	-5.48	-4.29	953.64	15.12			-4.28	15.48
	125	0.01		0.00	0.00		-0.013	0.000	0.000	-4.54	-3.42		21.90			-3.42	22.31
	126		0.01	0.00	0.00		-0.013	0.000	0.000	-3.58	-2.58		30.47			-2.58	30.95
	127 128		0.01	0.00 -0.01	0.00		-0.013	0.000	0.000	-2.38 -1.88		955.23 954.55	37.76			-1.52	38.31
	128			-0.01	0.00		-0.068 -0.095	0.013 0.014	0.002	-1.88 -1.19		955.22	46.50 53.91			-0.74 0.21	47.20 54.76
	130			-0.01	0.02		-0.147		-0.012			954.51	62.69			0.91	63.87
	131			-0.02	0.02		-0.162	0.029	-0.010	-0.86		955.06	70.21			1.70	71.59
91	132	0.21	0.00	-0.05	0.00	0.227	0.000	0.081	0.016	-0.73	1.86	953.90	79.43			2.12	80.70
	133			-0.05	0.00	0.227	0.000	0.081		-0.46		954.62	86.79			2.39	88.18
	134			-0.05	0.00	0.261	0.000	0.088		-1.17		953.96	95.52			2.26	97.03
	135 136			-0.05 -0.04	0.01	0.271 0.282	0.000 0.000	0.091 0.080		-1.06 -1.19		954.51 953.63	103.04 111.99			2.38 2.12	104.66 113.64
	137			-0.04		0.294	0.000						111.99				121.61
	137			-0.02 -0.01	0.01	0.294	0.000	0.058	-0.001	-0.86		953.74 952.74	129.03			1.98	130.77
	139		0.00		0.01	0.318	0.000		-0.005			952.81	137.03				138.90
99	140	0.29	0.00	0.01	0.01	0.318	0.000	0.026	-0.009	-1.59	1.76	951.63	146.28			1.70	148.28
Z:	= 42 (Mo)															
35		-0.27	0.00	0.06	-0.01	-0.278	0.000	-0.037	0.024	1.44	4.17	584.96	3.68			4.13	3.06
36	78		0.00		-0.03	0.403		-0.020	0.010	0.12			-7.13				-7.69
37	79		0.00		-0.03	0.403	0.000	-0.020	0.010	-0.30	4.09	619.66	-14.89				-15.39
38	80		0.00		-0.02	0.428			-0.004				-24.99				-25.38
39	81		0.00		-0.01	0.440			-0.014				-31.42				-31.76
40	82		0.00	0.08	0.00	0.465			-0.028				-40.07				-40.29
41	83		0.00	0.09	0.01	0.492			-0.042				-45.28				-45.46
42 43		-0.23 -0.23		0.10 0.10		-0.234 -0.234			-0.019 -0.019	0.22 -0.04			-53.47 -57.44				-53.53 -57.47
44		-0.23		0.10		-0.234 -0.234			-0.019					-64.56	0.438		-63.88
45		-0.23		0.10		-0.234			-0.019								-66.99
46		0.23		0.00	0.00	0.000	0.000	0.000		0.75				-72.70			-72.90

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} FL (MeV)	M _{th} ^{FL} (MeV)
	= 42 ((Mo)															
47		-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	0.12	0.80	761.12	-75.63	-75.00	0.015	0.80	-75.56
48	90	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-1.25			-81.05		0.006	-0.38	-80.96
49	91		0.00	0.01	0.00	0.032	0.000	-0.012	-0.000	-2.19			-83.00		0.011		-82.91
50 51	92 93	0.00 -0.01		0.00 0.00	0.00	0.000 -0.011	0.000 0.000	0.000 0.000	0.000 0.000	-3.30 -2.39			-87.46 -87.22		0.004 0.004	-2.15 -1.45	-87.35 -87.11
52	94		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.24			-88.94		0.002		-88.83
53	95		0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.10			-87.68		0.002		-87.57
54	96		0.00		0.01	0.150	0.000	0.045	-0.004	0.17	1.85	830.34	-88.36	-88.79	0.002		-88.22
55	97		0.00		0.02	0.172	0.000		-0.015	0.60			-86.92		0.002		-86.79
56	98		0.00	0.00	0.02	0.206	0.000		-0.019	0.86			-87.64		0.002		-87.50
57 58	99 100		0.00 0.00	0.00	0.02	0.239 0.251	0.000 0.000		-0.018 -0.021	0.85 1.10			-85.61 -85.94		0.002 0.006		-85.48 -85.80
	100		0.00	0.00	0.02	0.231	0.000		-0.021 -0.006	0.55			-83.94 -83.71		0.006		-83.59
	102		0.00	0.00	0.01	0.329	0.000		-0.005	-0.11			-83.78		0.021		-83.64
61	103	0.34	0.00	0.01	0.02	0.376	0.000	0.042	-0.016	-1.19	3.79	879.72	-81.23	-80.85	0.061	3.89	-81.09
	104		0.00	0.02	0.02	0.377	0.000		-0.020	-1.09			-80.69		0.054		-80.52
	105		0.00	0.03	0.02	0.389	0.000			-1.40			-77.35 -76.23		0.071		-77.20
	106 107		0.00	0.03 0.04	0.01	0.354 0.343	0.000 0.000	-0.006		-0.65 -0.63			-70.23 -72.66		0.018 0.162		-76.11 -72.58
	108		0.00	0.05		0.333		-0.023		-0.47			-71.12	, _,,	0.102		-71.02
67	109	0.30	0.00	0.06	-0.02	0.333	0.000	-0.036	0.002	-0.65	3.59	914.03	-67.11			3.72	-67.01
	110		0.00		-0.03	0.334		-0.050	0.008	-0.91			-65.34				-65.17
	111		0.00		-0.03	0.335		-0.062		-1.50			-60.94				-60.76
	112 113		0.00 0.00		-0.03 -0.03	0.323 0.312		-0.064 -0.067	0.005 0.006	-1.25 -1.14		929.54 932.62	-58.41 -53.42				-58.19 -53.21
		-0.22		0.07		-0.227		-0.059	0.007	0.25			-50.44				-50.28
		-0.22		0.07		-0.227		-0.071	0.007	-0.35		940.85					-45.28
74	116	-0.19	0.00	0.08	0.03	-0.195	0.000	-0.076	-0.010	-0.34	1.95	945.80	-42.38			2.26	-42.08
		-0.18		0.08		-0.184			-0.020	-0.97			-37.35				-36.97
		-0.16		0.08		-0.164			-0.021				-34.05				-33.62
		-0.16 -0.15		0.08 0.07		-0.164 -0.154		-0.081 -0.071	-0.021	-2.45 -2.73			-28.39 -24.68				-27.93 -24.30
		-0.13 -0.12		0.07		-0.134 -0.124			-0.013 -0.019				-24.08 -19.14				-24.30 -18.76
80	122	0.00	0.00	-0.01	0.00	0.000	0.000	0.012		-3.65	-2.64	967.22	-15.38			-2.63	-15.25
81	123	0.02	0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-5.61	-4.36	970.00	-10.09			-4.36	-9.92
	124		0.00	0.01	0.00	0.000		-0.012			-5.67		-6.42			-5.66	-6.21
	125 126	-0.01	0.00	-0.01 0.01	0.01	-0.011 0.000	0.000	0.012 -0.012	-0.010 0.000	-6.05 -5.03	-4.83	974.28 976.11	1.77 8.02			-4.80 -3.89	2.05 8.33
	127		0.00	0.01	0.00	0.000		-0.012 -0.012	0.000	-3.03 -4.06		975.66	16.54			-3.04	16.91
	128		0.00	0.01	0.00	0.000		-0.012	0.000	-2.86		977.01	23.26			-1.96	23.70
	129	0.00	0.00	0.01	0.00	0.000		-0.012	0.000	-1.93		976.30	32.04			-1.15	32.54
	130		0.00	0.00	0.01	0.000	0.000					977.47	38.94			-0.19	39.54
	131 132			-0.01 -0.01	0.02	0.025 0.004	-0.121 -0.135	0.015	-0.014 -0.003			976.77 977.76	47.71 54.79			0.57 1.40	48.65 55.83
	133			-0.01 -0.06	0.00	0.004	0.000	0.010		-0.33 -0.94		976.70	63.93			2.07	65.14
	134			-0.05	0.00	0.227	0.000	0.081		-0.53		977.84	70.86			2.37	72.08
	135			-0.05	0.00	0.227	0.000	0.081	0.016	-0.59		977.16	79.60			2.29	80.93
	136			-0.05	0.01	0.260	0.000	0.088		-0.80		978.17	86.67			2.52	88.10
	137			-0.04	0.01	0.271	0.000	0.078		-0.91		977.19	95.72			2.40	97.18
	138			-0.03	0.01	0.271	0.000	0.065				977.87	103.11			2.64	104.64
	139 140			-0.02 -0.01	0.02	0.294 0.306	0.000 0.000		-0.009 -0.012			976.89 977.55	112.16 119.57			2.35 2.38	113.80 121.33
	141		0.00	0.00	0.02	0.306	0.000		-0.012 -0.016			976.45	128.75			1.97	130.63
100	142	0.29	0.00	0.01	0.02	0.318	0.000	0.027	-0.019	-1.29	1.96	976.86	136.41			2.04	138.45
101	143	0.29	0.00	0.02	0.02	0.319	0.000	0.015	-0.022	-1.61	1.63	975.48	145.86			1.72	148.07
102	144	0.29	0.00	0.03	0.02	0.320	0.000	0.003	-0.026	-1.51	1.64	975.70	153.71			1.79	156.16

N	A	ε_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 43 ((Ta)															
36		-0.27	0.00	0.08	0.02	-0.277	0.000	-0.061	0.004	1.12	3.89	600.13	3.86			3.85	3.30
37		-0.24		0.08		-0.247		-0.068	-0.007	1.64		616.30	-4.24			4.14	-4.72
38	81		0.00	0.06	-0.02	0.415		-0.015	0.001	-0.62		634.61					-14.95
39 40	82 83	-0.38 -0.23	0.00	0.07 0.10		0.428 -0.234		-0.022 -0.092		-1.10 0.56		649.96 667.23					-22.19 -31.19
41		-0.23		0.10		-0.234		-0.092		0.28		681.62					-37.47
42		-0.24		0.10		-0.243		-0.101		-0.49		698.02					-45.72
43		-0.24		0.12		-0.243		-0.112		-0.95		711.27					-51.21
44 45		-0.24 -0.24		0.11 0.11		-0.243 -0.244		-0.101 -0.101	-0.024	-1.21 -1.50		726.35 738.17					-57.81 -61.55
46	89		0.00	0.00	0.00	0.032	0.000	0.000	0.000	0.49		752.42					-67.70
47	90		0.00	0.00	0.00	0.052	0.000	0.000	0.000	-0.49			-07.72 -71.17	-71.21	0.242		-07.70 -71.13
48	91	0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-1.57			-76.77		0.200	-0.68	-76.72
49	92		0.00	0.00	0.00	0.043	0.000	0.001	0.000	-2.51			-79.53		0.026		-79.46
50	93		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.59			-84.15		0.004		-84.07
51 52	94 95		0.00 0.00	0.00 0.00	0.00 0.00	0.021 0.021	0.000 0.000	0.000	0.000 0.000	-2.59 -1.43			-84.58 -86.47		0.004 0.005		-84.49 -86.37
53	96			-0.03	0.00	0.128	0.000	0.043	0.005	-0.91			-85.45		0.005		-85.35
54	97			-0.03	0.01	0.150	0.000	0.045	-0.004	-0.31			-86.96		0.005		-86.85
55	98			-0.01	0.02	0.172	0.000		-0.017	0.21			-86.30		0.004		-86.20
56	99 100			-0.01	0.03	0.194	0.000 0.000		-0.027 -0.021	0.47			-87.16		0.002		-87.04
	100		0.00 0.00	0.01	0.02 0.02	0.206 0.228	0.000		-0.021 -0.018	0.88 0.99			-85.80 -86.28		0.002 0.024		-85.71 -86.17
	102			-0.01	0.02	0.272	0.000		-0.014	0.51			-84.61		0.009		-84.52
60	103	0.27	0.00	-0.01	0.01	0.294	0.000	0.045	-0.003	0.27	3.96	882.34	-84.64	-84.60	0.010	4.01	-84.54
	104		0.00	0.00	0.01	0.306	0.000		-0.006	0.13			-82.62		0.046		-82.56
	105 106		0.00 0.00	0.00	0.01	0.318 0.318	0.000 0.000		-0.005 -0.009	-0.07 -0.16	4.03 3.94		-82.21 -79.79		0.055 0.013		-82.13 -79.74
	107		0.00	0.01	0.00	0.318	0.000		-0.003	-0.10 0.08			-79.79 -78.86		0.013		-79.74 -78.82
	108		0.00	0.03	0.00	0.308	0.000	-0.002	-0.006	-0.13			-76.03		0.126		-76.01
66	109	0.28	0.00	0.04	-0.01	0.309	0.000	-0.016	-0.000	-0.17	3.67	920.73	-74.60	-74.54	0.096		-74.57
	110 111		0.00		-0.02	0.309		-0.029	0.006	-0.29			-71.17		0.077		-71.14
	111		0.00 0.00		-0.02 -0.03	0.310 0.311		-0.041 -0.055	0.003	-0.35 -0.92			-69.19 -65.58		0.109 0.124		-69.12 -65.48
		-0.25		0.08		-0.258		-0.064		-0.36		941.66		00.00	0.12.		-63.08
71	114	-0.25	0.00	0.08	0.01	-0.258	0.000	-0.064	0.012	-0.58	2.74	945.63	-59.14			2.93	-59.01
		-0.22		0.07		-0.227		-0.059		-0.12		951.01					-56.34
		-0.22 -0.19		$0.08 \\ 0.08$		-0.227 -0.195		-0.071 -0.076	0.001 -0.010			954.69 959.76					-51.90 -48.83
		-0.19		0.08		-0.195 -0.185			-0.010 -0.011			963.15					-44.13
		-0.16		0.08	0.04	-0.164			-0.021			968.13					-40.94
		-0.16		0.08	0.04	-0.164			-0.021	-2.67	-0.60	971.54	-36.62				-36.26
		-0.16		0.07		-0.164			-0.023			975.68					-32.33
	122	-0.15	0.00	0.07 0.00	0.03	-0.154 0.000	0.000	-0.071 0.000	-0.015	-3.99 -3.67							-27.32 -23.96
	124		0.00	0.01	0.00	0.021	0.000		-0.000								-19.25
	125		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.15		991.02					-15.62
	126	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000	-6.13		991.49	-8.15			-4.94	-7.98
	127		0.00	0.00	0.00	0.000	0.000	0.000		-5.09	-3.99		-1.95			-3.99	-1.73
	128 129	-0.01	0.00	0.01	0.00	-0.010 0.000	-0.013 0.000	-0.012 0.000	0.000 -0.010	-4.10	-3.11 -2.03		6.02 12.68			-3.10 -2.01	6.29 13.02
	130		0.00	0.00	0.00	0.000	-0.000	0.000	-0.010	-2.87 -1.90		994.88	20.92			-2.01 -1.18	21.31
88	131		0.00	0.01	-0.01	0.000	0.000	-0.012	0.010	-0.84		995.92	27.78			-0.19	28.27
	132		0.08	0.00	0.01	0.034	-0.108	0.003	-0.006			995.63	36.14			0.60	36.83
	133			-0.04	0.01	0.161	0.000		-0.002			996.57	43.28			1.51	44.03
	134 135			-0.05 -0.06	0.01	0.194 0.216	0.000 0.000	0.076 0.092		-0.61 -0.89		996.45 997.75	51.47 58.24			1.78 2.19	52.37 59.38
<i>9</i> 2	133	0.20	0.00	-0.00	0.00	0.210	0.000	0.092	0.010	-0.09	1.04	221.13	J0.2 4			2.19	<i></i>

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 43	(Tc)															
93	136	0.21	0.00	-0.05	0.00	0.227	0.000	0.081	0.016	-0.85	1.84	997.55	66.51			2.09	67.64
	137			-0.05	0.01		0.000	0.086		-0.80	2.10	998.57	73.56			2.35	74.79
	138 139			-0.04 -0.03	0.02 0.01		0.000 0.000	0.079 0.065	-0.004 0.003	-1.08 -0.69	2.15 2.37	998.05 998.86	82.15 89.42			2.34 2.47	83.42 90.72
	140			-0.03 -0.02	0.01		0.000	0.056	-0.010	-0.09 -0.97	2.17	998.33	98.01			2.26	99.42
98	141	0.27	0.00	-0.01	0.02	0.294	0.000	0.046	-0.013	-0.86	2.25	999.00	105.41			2.33	106.94
	142	0.28	0.00	0.00	0.02	0.306	0.000		-0.016	-1.31	1.89	998.40	114.09			1.94	115.72
	143		0.00	0.01	0.02		0.000		-0.019		1.92	998.87	121.69			1.99	123.48
	144 145	0.29	0.00	0.02 0.02	0.02 0.02		0.000 0.000		-0.022 -0.023		1.62 1.70	997.97 998.15	130.66 138.55			1.69 1.79	132.60 140.67
							0.000					997.01	147.76			1.79	150.06
103	146 147		0.00 0.00	0.03 0.04	0.02 0.02		0.000		-0.026 -0.029		1.40 1.46	996.98	155.86			1.66	158.42
			0.00	0.0.	0.02	0.010	0.000	0.011	0.02		11.10	,,,,,,	100.00			1.00	1002
	= 44 ((Ru) -0.24	0.00	0.08	0.02	0.247	0.000	0.069	0.007	1 25	2.60	614.01	4.44			2 67	2.04
37 38		-0.24 -0.23		0.08				-0.068 -0.081		1.35 1.15	3.69 3.57	614.91 633.97	-6.54			3.67 3.59	3.94 -6.93
39		-0.23		0.10				-0.092		0.88	3.56		-14.01				-14.33
40	84	-0.23	0.00	0.10	0.05	-0.234	0.000	-0.092	-0.019	0.36	3.21	667.67	-24.10			3.23	-24.34
41	85	-0.23	0.00	0.10	0.05	-0.234	0.000	-0.092	-0.019	0.08	3.04	682.32	-30.68			3.04	-30.88
42		-0.24		0.11				-0.101		-0.69	2.63		-39.76				-39.89
43				0.11				-0.101		-0.98	2.43		-45.38				-45.48
44 45	88 89	-0.24 -0.24		0.11 0.11		-0.243 -0.243			-0.024 -0.024		2.13 1.87		-53.36 -57.43				-53.39 -57.45
46	90	0.01		0.00	0.00		0.000	0.000	0.000	-0.27	0.52		-64.86				-64.87
47	91	-0.02		0.00	0.00	-0.021		0.000	0.000	-0.98	-0.19		-68.53				-68.52
48	92	0.00		0.00	0.00		0.000	0.000	0.000	-2.37	-1.41		-74.97				-74.93
49	93	0.03	0.00	0.01	0.00	0.032	0.000	-0.012	-0.000	-3.27	-2.16	794.09	-77.88	-77.27	0.085	-2.16	-77.83
50	94	0.00		0.00	0.00		0.000	0.000	0.000	-4.38	-3.17		-83.28		0.013	-3.17	
51	95	-0.02		0.00	0.00	-0.021		0.000	0.000	-3.36	-2.40		-83.92		0.012	-2.40	
52	96		0.00	0.00	0.00		0.000	0.000	0.000	-2.22	-1.45		-86.59		0.008	-1.45	
53 54	97 98		0.00	-0.03 -0.03	0.00		0.000 0.000	0.041 0.044	0.004 -0.005	-1.45 -0.89	0.12 1.05		-85.70 -87.66		0.008		-85.61 -87.56
55	99			-0.03 -0.02	0.01		0.000		-0.005	-0.40	1.72		-87.00		0.000		-86.91
	100	0.17	0.00	-0.01	0.03	0.183	0.000		-0.027	0.00	1.92	861.71	-89.00	-89.22	0.002		-88.89
57	101	0.18	0.00	0.01	0.02	0.195	0.000	0.003	-0.021	0.58	2.63	868.43	-87.65	-87.95	0.002	2.66	-87.56
	102		0.00	0.01	0.02		0.000		-0.021	0.86	3.13		-88.69		0.002		-88.59
	103		0.00	0.01	0.02		0.000		-0.021	0.86	3.45		-87.12		0.002		-87.04
	104 105			-0.01 -0.01	0.01		0.000 0.000		-0.004 -0.003	0.53 0.24	3.65 3.71		-87.83 -85.94		0.003 0.003		-87.74 -85.87
													-86.14				
	106 107		0.00 0.00	0.00	0.01		0.000 0.000		-0.007 -0.010	0.42 0.36	3.83 3.76		-80.14 -83.81		0.008 0.124		-86.07 -83.77
	108		0.00	0.02	0.00		0.000		-0.003	0.37	3.73		-83.59		0.116		-83.56
	109		0.00	0.03	-0.01			-0.008	0.003	0.21	3.63		-80.78		0.066		-80.76
66	110	-0.24	0.00	0.06	0.00	-0.248	0.000	-0.044	0.014	0.42	3.53	933.52	-80.10	-79.98	0.053	3.65	-80.03
		-0.24		0.06		-0.248			0.014	0.34	3.34		-76.88		0.074		-76.82
		-0.25				-0.258			0.018	-0.08	3.29		-75.62		0.074		-75.53
		-0.25 -0.25		0.08		-0.258 -0.258				-0.62 -0.69	2.92 2.72		-72.10 -70.51	-72.20	0.070		-71.98 -70.39
		-0.25				-0.258				-0.94	2.36		-66.53	-66.43	0.129		-66.41
		-0.22		0.07		-0.227			0.007	-0.51	2.16	966.32	-64.47				-64.38
		-0.22		0.08		-0.227				-1.13	1.69		-60.16				-60.03
74	118	-0.19	0.00	0.08	0.03	-0.195	0.000	-0.076	-0.010		1.36	975.77	-57.78				-57.59
		-0.18		0.09					-0.017		0.64		-53.31				-53.01
		-0.16		0.08					-0.021		0.13		-50.69				-50.40
		-0.16		0.08					-0.021				-45.87				-45.56
		-0.12 -0.12		0.06					-0.019 -0.019				-43.00 -38.15				-42.81 -37.93
	123	0.00		0.00	0.03		0.000	0.000				1001.68					-37.93 -35.27

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} ^{FL} (MeV)
Z	= 44 ((Ru)															
	125		0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-6.48	-5.22	1005.16	-30.67			-5.21	-30.64
82	126	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.98	-6.57	1010.28	-27.72				-27.67
83	127	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-6.89		1010.75					-20.03
	128		0.00	0.00	0.00	0.000	0.000	0.000				1013.22					-14.39
85	129	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-4.77	-3.73	1013.29	-6.52			-3.73	-6.34
	130		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1015.28	-0.43			-2.64	-0.21
	131		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.55		1015.15	7.77			-1.78	8.05
	132		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.42		1016.87	14.12			-0.76	14.46
	133 134		0.03	-0.03 -0.04	0.00		-0.041 -0.028	0.042 0.058	0.005 -0.002	-1.33 -0.83		1016.37 1018.00	22.69 29.13			0.27 1.13	23.19 29.77
	135 136			-0.04 -0.05	0.01 0.01	0.161 0.205	0.000	0.059 0.078		-0.40 -0.59		1017.66 1019.45	37.54 43.83			1.59 2.02	38.24 44.70
	137			-0.05	0.01	0.203	0.000	0.078		-0.93		1019.43	52.07			2.04	53.03
	138			-0.05	0.01	0.227	0.000	0.082		-0.61		1020.84	58.58			2.33	59.65
95	139	0.23	0.00	-0.04	0.01	0.249	0.000	0.073		-0.72	2.24	1020.26	67.24			2.41	68.32
96	140	0.24	0.00	-0.04	0.02	0.260	0.000	0.076	-0.005	-0.72	2.29	1021.76	73.80			2.51	75.04
	141			-0.03	0.02	0.271	0.000		-0.007			1021.21	82.42			2.31	83.70
98	142	0.25	0.00	-0.02	0.02	0.271	0.000	0.054	-0.010	-0.55	2.36	1022.29	89.41			2.49	90.78
99	143	0.26	0.00	-0.01	0.02	0.283	0.000	0.044	-0.013	-0.90	2.05	1021.68	98.10			2.13	99.55
100	144	0.27	0.00	0.00	0.02	0.295	0.000	0.034	-0.016	-0.89	2.11	1022.63	105.21			2.20	106.80
101	145	0.28	0.00	0.01	0.03	0.307	0.000	0.026	-0.029	-1.41	1.65	1021.92	113.99			1.88	115.85
	146		0.00	0.02	0.02	0.308	0.000		-0.023			1022.48	121.50			1.98	123.40
103		0.28		0.03	0.02	0.309	0.000		-0.026			1021.34	130.71			1.75	132.79
	148		0.00	0.04	0.02	0.310	0.000		-0.029	-1.25		1021.73	138.40			1.98	140.71
105			0.00	0.04	0.01	0.287			-0.019			1020.22	147.99			1.74	150.33
106	150	0.26	0.00	0.05	0.00	0.287	0.000	-0.031	-0.013	-0.97	1.77	1020.38	155.89			1.88	158.41
\boldsymbol{Z}	= 45	(Rh)															
38		-0.23		0.09		-0.235	0.000	-0.081	-0.013	0.69	3.18	630.02	4.70			3.18	4.28
39		-0.23		0.10		-0.234		-0.092		0.45	3.28	646.31	-3.53			3.27	-3.89
40		-0.23		0.10		-0.234		-0.092		-0.08	2.74		-13.97				-14.26
41 42		-0.23 -0.24		0.10 0.11		-0.234 -0.243		-0.092	-0.019 -0.024	-0.36 -1.14	2.57 2.20		-21.40 -30.61				-21.65 -30.79
43		-0.24		0.11		-0.243			-0.024		2.09		-36.98				-37.13
44 45	89 90	-0.24	0.00		0.00	-0.243 0.107	0.000	0.016	-0.024	-0.06	1.70 1.24		-45.21 -50.65				-45.30 -51.05
46	91		0.00		0.00	0.075	0.000	0.002		-1.00	0.02		-58.43				-58.47
47	92		0.00		0.00	0.085	0.000	0.003		-1.82			-62.87				-62.88
48	93		0.00	0.00	0.01	0.000	0.000	0.000	-0.010	-2.96	-2.02	785.04	-69.61				-69.60
49	94		0.00	0.01	0.00	0.032	0.000		-0.000				-73.31				-73.28
50	95		0.00		0.00	0.000	0.000	0.000		-4.95			-78.87	-78.34	0.150		-78.83
51	96			-0.02	0.00	0.053	0.000	0.025		-4.07		819.74	-80.10	-79.68	0.013		-80.04
52	97	0.04	0.00	-0.01	0.00	0.043	0.000	0.013	0.001	-2.85	-1.91	830.67	-82.96	-82.59	0.036	-1.91	-82.90
53	98	0.10	0.00	-0.03	0.00	0.107	0.000	0.041	0.004	-2.21	-0.56	838.84	-83.06	-83.18	0.012	-0.55	-82.99
54	99			-0.03	0.01	0.139	0.000		-0.005	-1.60	0.42		-85.11		0.007		-85.04
	100			-0.01	0.02	0.161	0.000		-0.018	-1.03	1.09		-85.21		0.018		-85.14
	101		0.00		0.03	0.184	0.000			-0.65	1.25		-87.38		0.017		-87.29
	102		0.00		0.02	0.184	0.000		-0.021	0.03	1.82		-86.91		0.005		-86.84
	103		0.00	0.01	0.02	0.195	0.000		-0.021	0.43	2.33		-88.07		0.003		-88.00
	104		0.00		0.01	0.217	0.000		-0.011	0.63	3.06		-86.82		0.003		-86.77
	105		0.00	0.01	0.01	0.217	0.000		-0.011	0.88	3.28		-87.64		0.004		-87.60
	106 107		0.00 0.00		0.01	0.250 0.250	0.000	0.036	-0.005 0.002	0.51 0.63	3.47 3.49		-86.32 -86.74		0.008 0.012		-86.29 -86.72
	108		0.00		0.00	0.250	0.000	0.011		0.70	3.55		-85.00		0.105		-85.00 84.06
	109 110	0.24 -0.24			-0.01	0.262 -0.248		-0.001 -0.034	0.006 0.002	0.48 0.31	3.46 3.32		-84.96 -82.88		0.012 0.050		-84.96 -82.87
		-0.24 -0.24		0.05		-0.248		-0.034 -0.045	0.002	0.31	3.29		-82.88 -82.23		0.030		-82.87 -82.21
		-0.24				-0.248		-0.044	0.014	0.06	3.03		-79.75		0.052		-79.74
						. = .0											

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 45 ((Rh)															
		-0.24	0.00	0.07	0.00	-0.248	0.000	-0.055	0.017	-0.32	2.92	955.53	-78.67	-78.68	0.049	3.05	-78.62
		-0.25		0.07	0.00	-0.258		-0.053	0.018	-0.83	2.62		-75.74		0.113		-75.71
		-0.25		0.08		-0.258		-0.064		-1.07	2.37		-74.30		0.081		-74.23
		-0.25 -0.23		0.08 0.07		-0.258		-0.064 -0.058	0.012 0.008	-1.32 -1.07	2.03 1.80		-70.95 -69.02	-70.74	0.138		-70.89 -68.99
						-0.237											
		-0.22 -0.19		0.08		-0.227 -0.195		-0.071 -0.076		-1.53 -1.59	1.38 1.04		-65.31 -63.04				-65.23 -62.91
		-0.19		0.08		-0.185		-0.078		-2.16	0.43		-59.08				-58.95
		-0.16		0.08	0.04	-0.164	0.000	-0.081	-0.021	-2.38	-0.12		-56.59				-56.37
77	122	-0.16	0.00	0.08	0.04	-0.164	0.000	-0.081	-0.021	-3.38	-0.92	1001.91	-52.41			-0.59	-52.18
		-0.12		0.06		-0.124	0.000					1007.28					-49.58
		-0.03		0.00		-0.032	0.000	0.000	0.000			1011.08					-45.52
	125 126	-0.02	0.00	0.00 0.01	0.00	-0.021 0.021	0.000 0.000	0.000 -0.012	0.000 -0.000			1016.54 1020.45					-42.89 -38.70
	127		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1025.69					-35.85
83	128	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-7.24	-6.00	1026.70	-28.78			-6.00	-28.76
	129	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000			1029.24					-23.19
	130		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-5.07		1029.86					-15.71
	131		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1031.90	-9.76			-2.94	-9.62
	132		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.82		1032.32	-2.11			-2.06	-1.93
	133 134		0.00	0.00 -0.03	0.00 0.00	0.000 0.118	0.000 -0.028	0.000 0.042	0.000	-1.69 -1.60		1034.11 1034.17	4.17 12.18			-1.04 -0.03	4.40 12.55
	135			-0.03 -0.04	0.00	0.110	0.000	0.042	-0.002	-1.00		1034.17	18.38			0.64	18.87
	136			-0.02	0.01	0.161	0.000	0.034		-0.49		1036.01	26.49			1.28	26.96
92	137	0.15	0.00	-0.03	0.01	0.161	0.000	0.047	-0.004	-0.03	1.70	1037.71	32.85			1.79	33.44
93	138	0.21	0.00	-0.05	0.01	0.227	0.000	0.082	0.006	-1.20	1.65	1038.16	40.47			1.86	41.26
	139			-0.05	0.01	0.227	0.000	0.082	0.006	-0.88		1039.83	46.88			2.09	47.76
	140 141			-0.04 -0.04	0.01 0.02	0.227 0.249	0.000 0.000	0.069		-0.64 -0.68		1039.88 1041.22	54.90 61.63			2.08 2.39	55.80 62.67
	142			-0.04 -0.03	0.02	0.249	0.000		-0.000 -0.007			1041.18	69.75			2.22	70.82
	143			-0.02	0.02	0.283	0.000		-0.010			1042.34	76.65			2.36	77.82
	144			-0.01	0.02	0.283	0.000			-1.10		1042.24	84.82			2.01	86.06
100			0.00	0.00	0.02	0.295	0.000	0.034	-0.016	-1.07		1043.21	91.92			2.10	93.28
	146		0.00		0.02	0.296	0.000		-0.019			1042.85				1.81	101.84
102			0.00	0.02	0.02	0.296	0.000		-0.023			1043.59					109.34
103			0.00	0.03	0.02	0.309	0.000		-0.026 -0.026			1042.93 1043.40	116.42			1.70 1.81	118.23 125.99
104 105			0.00 0.00	0.03 0.04	0.02 0.01	0.297 0.275			-0.020 -0.019			1043.40	124.02 133.09				125.99
106			0.00	0.05	0.00	0.276			-0.012			1042.67	140.90				143.14
107	152	0.24	0.00	0.06	-0.01	0.265	0.000	-0.049	-0.005	-1.29	1.27	1041.65	149.98			1.43	152.45
108	153	0.24	0.00	0.07	-0.01	0.266	0.000	-0.061	-0.008	-1.33	1.20	1041.82	157.88			1.48	160.63
\boldsymbol{z}	= 46 ((Pd)															
40		-0.23	0.00	0.09	0.05	-0.235	0.000	-0.081	-0.022	-0.10	2.39	663.95	-5.80			2.41	-6.09
41		-0.23		0.09		-0.235			-0.022		2.24		-13.37				-13.62
42		-0.23		0.10		-0.234			-0.019		1.89		-23.40				-23.58
43		-0.23		0.10		-0.234			-0.028		1.78		-29.93				-30.08
44	90	0.00		0.00	0.00	0.000	0.000	0.000		-0.12	0.63		−39.75				-39.87
45	91 92	-0.01		0.00		-0.011	0.000	0.000		-0.53	0.19		-45.66 54.45				-45.75
46 47	92	0.00 -0.02		0.00	0.00	0.000 -0.021	0.000 0.000	0.000 0.000		-1.72 -2.42			-54.45 -59.07				-54.51 -59.10
48	94		0.00	0.00	0.00	0.011	0.000	0.000		-3.84			-66.49				-66.49
49	95		0.00	0.01	0.00	0.032	0.000	-0.012	-0.000	-4.73	-3.58	801.13	-70.35			-3.59	-70.33
50	96	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.87	-4.63	815.59	-76.73	-76.23	0.151	-4.64	-76.70
51		-0.02		0.00		-0.021	0.000	0.000		-4.84			-78.23			-3.81	
52	98	-0.01		0.00		-0.011	0.000	0.000		-3.69			-81.79			-2.83	
53 54	99 100			-0.02 -0.02	0.00	0.107 0.128	0.000 0.000	0.028	-0.003	-2.92		844.96 855.85	-81.88 -84.71				-81.83 -84.64
	100	0.12	0.00	0.02	0.01	0.120	0.000	0.031	0.007	2.13	0.55	000.00	UT./I	05.25	0.011	0.54	

N	A	ε_2	ε_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 46 ((Pd)															
	101	` ′	0.00	-0.01	0.02	0.150	0.000	0.022	-0.018	-1.67	0.34	864.12	-84.91	-85.43	0.018	0.35	-84.85
	102		0.00	0.00	0.03	0.162	0.000		-0.029	-1.11	0.98		-87.35		0.003	1.01	-87.27
	103		0.00	0.01	0.02	0.173	0.000		-0.021	-0.54	1.60		-86.97		0.003		-86.91
	104		0.00	0.01	0.02	0.173	0.000		-0.021	0.05	1.79		-89.18		0.004		-89.12
	105		0.00	0.03	0.00	0.174		-0.025		0.63	2.34		-88.23		0.004		-88.19
	106		0.00	0.03	0.00	0.185		-0.024		0.97	2.68		-89.65		0.004		-89.61
	107 108		0.00 0.00	0.02	0.00 -0.01	0.195 0.217		-0.010 -0.008	-0.003	1.22 1.10	3.24 3.32		-88.09 -89.16		0.004 0.003		-88.08 -89.14
	100		0.00		-0.01	0.239	0.000	0.008	0.009	0.84	3.37		-87.54		0.003		-87.54
	110		0.00	0.03	-0.01	0.240	0.000	-0.017	0.004	0.81	3.31		-88.17		0.011		-88.16
65	111	-0.24	0.00	0.05	0.01	-0.248	0.000	-0.034	0.002	0.36	3.31	945.99	-86.07	-86.00	0.011	3.37	-86.06
66	112	-0.24	0.00	0.05	0.00	-0.248	0.000	-0.033	0.011	0.29	3.20	954.18	-86.18	-86.34	0.018	3.28	-86.17
		-0.24		0.06		-0.248		-0.044	0.014	-0.12	2.97		-83.78		0.036		-83.77
		-0.25		0.07		-0.258		-0.053	0.018	-0.73	2.63		-83.60		0.024		-83.56
		-0.25		0.07		-0.258		-0.053		-1.10	2.37		-80.74		0.061		-80.71
		-0.25 -0.25		0.07		-0.258		-0.053 -0.053	0.018	-1.23	2.15		-79.93 -76.65		0.056 0.059		-79.89 -76.63
		-0.23 -0.22		0.07 0.07		-0.258 -0.227		-0.059	0.018	-1.46 -1.15	1.84 1.56		-76.63 -75.42		0.039		-76.03 -75.40
		-0.20		0.07		-0.206		-0.063		-1.33	1.21		-71.73	75.17	0.210		-71.72
		-0.16		0.07	0.03	-0.165			-0.014	-1.37	0.78	1002.75		-70.15	0.124	0.99	-70.12
75	121	-0.16	0.00	0.07	0.03	-0.165	0.000	-0.070	-0.014	-2.06	0.10	1007.03	-66.39			0.30	-66.33
76	122	-0.12	0.00	0.06	0.03	-0.124	0.000	-0.063	-0.019	-2.25	-0.66	1013.46	-64.74			-0.47	-64.69
		-0.12		0.06	0.03	-0.124			-0.019			1017.54					-60.70
	124		0.00	0.01	0.00	0.021						1023.51					-58.78
	125		0.00	0.00	0.01	0.011	0.000					1027.58					-54.76
	126 127		0.00 0.00	0.00	0.00	0.000	0.000 0.000	0.000 -0.012	0.000 -0.000			1033.86 1037.67					-52.97 -48.69
	128		0.00	0.00	0.00	0.021	0.000	0.000	0.000			1037.07					-46.28
	129	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000			1044.63					-39.47
84	130	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.12	-5.92	1047.73	-34.45			-5.92	-34.47
85	131	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.95	-4.88	1048.40	-27.04			-4.88	-27.03
	132		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1050.97					-21.50
	133		0.00	0.00	0.00	0.000	0.000	0.000				1051.43					-13.84
	134 135		0.02	$0.00 \\ -0.03$	0.00 0.00	0.032 0.118	-0.027 0.000	0.001 0.042				1053.73 1053.75	-8.16 -0.11			-1.74 -0.65	-8.01 0.14
								0.042				1056.12	5.59			0.04	5.91
	136 137			-0.03 -0.02	0.00	0.118 0.150	0.000 -0.014		-0.005			1056.12	13.67			0.04	14.03
	138			-0.03	0.01	0.161	0.000		-0.004			1058.32	19.54			1.34	20.00
	139			-0.06	0.01	0.216	0.000	0.093		-1.53		1058.36	27.56			1.94	28.30
94	140	0.20	0.00	-0.05	0.01	0.216	0.000	0.080	0.005	-0.89	1.74	1060.69	33.30			1.97	34.05
	141			-0.05	0.01	0.227	0.000	0.082		-1.07		1060.85	41.22			1.99	42.05
	142			-0.04	0.02	0.249	0.000		-0.006			1062.63	47.51			2.32	48.40
	143			-0.03 -0.02	0.02	0.260	0.000		-0.008 -0.010			1062.60	55.61			2.18	56.54
	144 145			-0.02 -0.02	0.02 0.03	0.271 0.271	0.000 0.000		-0.010 -0.021			1064.29 1064.33	62.00 70.02			2.33 2.01	63.00 71.22
100				-0.01	0.03	0.283	0.000		-0.023			1065.78	76.65			2.15	77.96
101			0.00	0.00	0.03	0.283	0.000		-0.025 -0.016			1065.25	85.25			1.92	86.53
102			0.00	0.01	0.02	0.284	0.000		-0.020			1066.49	92.08			2.03	93.51
103	149		0.00	0.02	0.02	0.285	0.000		-0.023			1065.88	100.76			1.79	102.33
104	150	0.26	0.00	0.03	0.01	0.286	0.000	-0.006	-0.016	-0.88	1.86	1066.76	107.95			1.93	109.61
105			0.00	0.04	0.01	0.275			-0.019			1065.87	116.91			1.77	118.75
106			0.00	0.05	0.00	0.264			-0.012			1066.60	124.25			1.88	126.26
107 108			0.00 0.00		-0.01 -0.01	0.253 0.242			-0.002 -0.004			1065.56 1066.21	133.36 140.79			1.59	135.51 143.20
108			0.00		-0.01 -0.02	0.242		-0.033 -0.068		-0.82 -1.14		1065.07	150.00				152.72
110			0.00		-0.02	0.231		-0.068		-1.05		1065.54					160.51
110	150	0.21	0.00	0.07	0.02	0.231	0.000	0.008	0.004	1.05	0.92	1005.54	137.00			1.50	100.31

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 47 ('Α σ)															
41	- / (0.05	0.01	0.00	0.00	0.053	-0.014	0.001	0.000	0.74	1.48	676.65	-3.14			1.48	-3.41
42	89	0.03		0.00	0.00	0.032	0.000	0.000	0.000	-0.04	0.76		-13.71				-13.93
43	90	0.07	0.00	0.00	0.00	0.075	0.000	0.002	0.000	-0.35	0.66	710.70	-21.05			0.65	-21.22
44	91	0.05		0.00	0.00	0.053	0.000	0.001		-1.30	-0.35		-30.89				-31.02
45	92	0.08		0.00	0.00	0.085	0.000	0.003	0.000	-1.89	-0.67		-37.48			-0.68	-37.58
46		0.07		0.00	0.00	0.075	0.000	0.002		-3.01			-46.47				-46.53
47 48	94 95	0.07 0.06		0.00 0.00	0.00	0.075 0.064	0.000 0.000	0.002 0.002	0.000	-3.76 -5.04	-2.50		-52.23 -60.06				-52.59 -60.08
49	96		0.00	0.00	0.02	0.064	0.000	0.002		-5.91			-64.79				-64.79
50	97	-0.03	0.00	0.00	0.00	-0.032	0.000	0.000	0.000		-5.62	817.50	-71.35	-70.82	0.322		-71.33
51	98	0.05	0.00	-0.01	0.00	0.053	0.000	0.013	0.001	-6.01	-4.72	827.77	-73.55	-73.06	0.067	-4.72	-73.52
52				-0.01	0.00	0.075	0.000	0.014	0.001	-4.95	-3.62		-77.14		0.151	-3.62	-77.11
	100			-0.02	0.00	0.107	0.000	0.028	0.003	-4.07			-78.26		0.077		-78.22
	101 102			-0.02 -0.01	0.01	0.117 0.139	0.000	0.030	-0.007 -0.018	-3.16 -2.61	-1.42 -0.68		-81.22 -82.12		0.104	-1.42	-81.18 -82.08
							0.000										
	103 104	0.14 0.14		0.00	0.03	0.151 0.151	0.000	-0.010	-0.029 -0.021	-1.94 -1.20	0.08 0.72		-84.58 -84.90		0.017 0.006		-84.52 -84.86
	105	0.15		0.02	0.01	0.162		-0.014		-0.65	1.30		-86.86		0.011		-86.82
	106	0.15		0.03	0.00	0.162	0.000	-0.027	-0.005	-0.11	1.84		-86.64		0.005	1.84	-86.62
60	107	0.16	0.00	0.03	0.00	0.174	0.000	-0.025	-0.005	0.33	2.30	914.93	-88.07	-88.40	0.004	2.31	-88.05
	108	0.17			-0.01	0.184		-0.025	0.005	0.70	2.49		-87.59		0.004		-87.58
	109	0.17			-0.01	0.184		-0.025	0.005	0.96	2.74		-88.60		0.003		-88.60
	110 111	0.19 0.19			-0.01 -0.02	0.207 0.206		-0.022 -0.023	0.004 0.014	0.96 1.01	3.01 2.99		-87.46 -88.16		0.003		-87.48 -88.17
		-0.23		0.03		-0.238		-0.024	0.009	0.41	3.08		-86.65		0.003		-86.68
		-0.24		0.05		-0.248		-0.033	0.011	-0.08	2.90		-86.95		0.017		-86.97
		-0.23		0.05		-0.238		-0.035	0.011	-0.22	2.70		-85.19		0.025		-85.23
68	115	-0.24	0.00	0.06	-0.01	-0.248	0.000	-0.043	0.023	-0.87	2.38	976.53	-85.10	-84.99	0.035	2.48	-85.11
		-0.24		0.06		-0.248		-0.044	0.014	-1.15	2.08		-82.93		0.047		-82.98
		-0.24		0.07		-0.248		-0.055	0.017	-1.45	1.84		-82.26		0.050		-82.27
		-0.24		0.06		-0.248		-0.044 -0.048		-1.49	1.62		-79.53		0.064		-79.58
	120	-0.22 0.16		0.06	-0.01	-0.227 0.174		-0.048 -0.038	0.005	-1.32 -0.88		1002.13 1007.21			0.090 0.073		-78.46 -75.54
		-0.12				-0.124			-0.012			1014.14					-74.36
75	122	-0.12	0.00	0.05	0.02	-0.124	0.000	-0.052	-0.012	-1.98	-0.47	1019.01	-71.08			-0.37	-71.16
76	123	-0.12	0.00	0.06	0.03	-0.124	0.000	-0.063	-0.019	-2.99	-1.28	1025.57	-69.57			-1.11	-69.57
		-0.12		0.06		-0.124						1030.30					-66.22
	125 126	-0.01	0.00	0.00 -0.01	0.00	-0.011 0.021	0.000 0.000	0.000				1036.60 1041.24					-64.63 -61.17
	127	0.02		0.00	0.00	0.021	0.000	0.012				1041.24					-51.17 -59.28
	128	0.03		0.00	0.00	0.032	0.000	0.000				1051.76					-55.54
	129	0.00		0.00	0.00	0.000	0.000	0.000				1057.58					-53.28
	130	-0.02		0.00	0.00	-0.021	0.000	0.000				1059.45					-47.06
	131	0.00		0.00	0.00	0.000	0.000	0.000				1062.58					-42.10
	132	0.00		0.00	0.00	0.000	0.000	0.000				1063.82					-35.23
	133	0.00		0.00	0.00	0.000	0.000	0.000				1066.45					-29.76
	134 135	0.00 0.02		0.00	0.00	0.000 0.021	0.000	0.000				1067.42 1069.79					-22.62 -16.88
	136			-0.03	0.00	0.021	0.000	0.040				1009.79	-16.93 -9.48			-2.30 -1.24	-10.88 -9.33
	137			-0.03	0.01	0.117	0.000	0.042				1072.79	-3.79			-0.50	-3.57
91	138	0.13	0.00	-0.02	0.01	0.139	0.000	0.032	-0.006	-1.33	0.07	1073.45	3.63			0.11	3.87
92	139	0.14	0.00	-0.01	0.01	0.150	0.000	0.021	-0.008	-0.68		1075.45	9.69			0.88	9.98
	140			-0.03	0.01	0.161	0.000		-0.004	-0.55		1076.07	17.15			1.31	17.54
	141 142			-0.05 -0.04	0.01	0.216 0.227	0.000 0.000	0.080	0.005 0.003	-1.17		1077.98	23.30			2.00 1.76	23.90
										-1.12		1078.87	30.49				31.09
	143 144			-0.04 -0.03	0.01	0.227 0.260	0.000 0.000	0.069		-0.83 -1.24		1080.79 1081.30	36.63 44.20			2.02 1.92	37.33 44.95
<i>91</i>	177	0.24	0.00	0.03	0.02	0.200	0.000	0.004	0.000	1.24	1./7	1001.30	77.20			1.74	

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7 :	= 47 (Άσ)															
	145	. 0,	0.00	-0.02	0.02	0.271	0.000	0.054	-0.010	-1.08	1.98	1083.01	50.57			2.10	51.39
99	146	0.25	0.00	-0.02	0.03	0.271	0.000	0.055	-0.021	-1.40	1.63	1083.52	58.12			1.82	59.12
100				-0.01	0.02	0.272	0.000		-0.014			1084.89	64.82			1.97	65.82
101			0.00	0.00	0.02	0.273	0.000		-0.017			1084.98	72.80			1.75	73.89
102		0.26		0.01	0.02	0.284	0.000		-0.020			1086.25	79.61			1.87	80.82
103		0.25 0.25		0.02	0.01	0.274	0.000		-0.013 -0.016			1086.04	87.89			1.65	89.14
104 105		0.23		0.03 0.04	0.01	0.274 0.264			-0.016 -0.009			1087.09 1086.63	94.91 103.44			1.75 1.60	96.34 104.99
106		0.23		0.05	0.01	0.254			-0.021			1087.47	110.67			1.76	112.49
107	154	0.23	0.00	0.05	-0.01	0.253	0.000	-0.039	-0.002	-1.02		1086.82	119.40			1.51	121.28
108	155	0.21	0.00	0.06	-0.01	0.231	0.000	-0.054	-0.004	-0.91	1.27	1087.57	126.71			1.48	128.85
109		0.21			-0.02	0.231		-0.068	0.004	-1.49		1086.99	135.36			1.14	137.78
110		0.21			-0.02	0.231		-0.068		-1.48		1087.42	143.00			1.12	145.60
111 112		0.20 0.20			-0.03 -0.03	0.220 0.220		-0.082 -0.082	0.012	-2.09 -2.16		1086.82 1087.12	151.68 159.45			0.67 0.56	154.66 162.63
113	160	-0.23	0.00	0.11	0.04	-0.235	0.000	-0.102	-0.007	-3.27	-0.89	1086.51	168.13			0.14	171.93
$oldsymbol{Z}$:	= 48 ((Cd)															
42		-0.01		0.00		-0.010		0.001		-1.22		694.69					-6.04
43	91	0.04		0.00	0.00	0.043	0.000	0.001	0.000	-1.23			-13.36				-13.54
44 45	92 93	0.04 0.04		0.00	0.00 0.00	0.043 0.043	0.000 0.000	0.001	0.000 0.000	-2.27 -2.70			-23.94 -30.82				-24.08 -30.92
46	94	0.04		0.00	0.00	0.043	0.000	0.001		-3.90			-30.62 -40.60				-30.92 -40.68
47	95	0.05		0.00	0.00	0.053	0.000	0.001	0.000	-4.65			-46.80				-46.85
48	96	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000	-6.00	-4.84		-55.92				-55.94
49	97	0.04		0.01	-0.01	0.043	0.000	-0.011	0.009	-6.95			-60.70				-60.70
50		-0.02		0.00		-0.021	0.000	0.000			-6.68		-68.05	-67.63	0.078	-6.68	
51		-0.03		0.00		-0.032	0.000	0.000	0.000		-5.85		-70.47				-70.45
		-0.03		0.00		-0.032	0.000	0.000	0.000		-4.84		-74.90		0.095	-4.84	
	101 102	0.07	0.00	0.00 -0.01	0.00 0.00	0.075 0.107	0.000 0.000	0.002 0.016	0.000		-3.39 -2.24		-75.95 -79.48		0.151 0.029	-3.39 -2.24	
	102		0.00		0.00	0.107	0.000		-0.001	-3.76			-79.48 -80.44		0.029	-2.24 -1.43	
	104		0.00	0.00	0.01	0.129	0.000		-0.010	-2.27	-0.63		-83.60			-0.63	
57	105	0.13	0.00	0.01	0.01	0.140	0.000	-0.004	-0.011	-1.72	-0.01	894.01	-84.07	-84.33	0.012	-0.01	-84.04
	106		0.00	0.02	0.01	0.151	0.000	-0.015	-0.013	-1.21	0.59	904.74	-86.73	-87.13	0.006	0.60	-86.70
	107		0.00	0.03	0.00	0.141			-0.004		1.06		-86.71		0.006		-86.69
	108 109	0.14			-0.01 -0.01	0.151		-0.029 -0.030	0.005	-0.21	1.53		-88.84		0.006		-88.82
			0.00			0.140			0.006	0.38	1.92		-88.28		0.004		-88.28
	110 111	0.14 0.15			-0.01 -0.02	0.152 0.162		-0.041 -0.040	0.004 0.013	0.50 0.74	2.20 2.52		-89.97 -88.90		0.003		-89.96 -88.91
	112		0.00		-0.02	0.102		-0.040 -0.039	0.013	0.74	2.52		-90.20		0.003		-90.21
	113	0.17			-0.02	0.185		-0.038	0.013	0.73	2.73		-88.74		0.003		-88.77
66	114	0.18	0.00	0.04	-0.02	0.196	0.000	-0.036	0.012	0.52	2.61	972.24	-89.67	-90.02	0.003	2.66	-89.70
67	115	-0.22	0.00	0.04	0.00	-0.228	0.000	-0.026	0.008	-0.13	2.54	978.53	-87.88	-88.09	0.003	2.59	-87.94
		-0.23				-0.238		-0.034		-0.71	2.27		-88.40		0.003		-88.43
		-0.23				-0.238		-0.034		-1.01	2.03		-86.29		0.003		-86.35
	118	-0.23 0.16		0.05	-0.00	-0.238 0.174		-0.035 -0.038		-1.13 -0.51		1001.11 1006.63			0.020 0.080		-86.31 -83.81
	120 121	0.13	0.00		-0.01 -0.01	0.140 0.140		-0.030 -0.030		-0.62 -1.15		1014.47 1019.69			0.019 0.085		-83.60 -80.76
		-0.10		0.03		-0.104						1017.69			0.043		-80.68
		-0.10		0.04		-0.104						1032.70			0.041		-77.61
76	124	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.97	-2.22	1039.95	-76.66	-76.71	0.063	-2.22	-76.86
77	125	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-3.98	-3.15	1044.77	-73.41	-73.36	0.069	-3.15	-73.61
		-0.02				-0.021	0.000	0.012				1051.89				-4.32	
		-0.01		0.00		-0.011	0.000	0.000				1056.52				-5.48	
	128 129	0.00	0.00	0.00	0.00 0.00	0.000 0.021	0.000	0.000 -0.012				1063.42 1067.87		−o7.29	0.294	-6.86 -8.22	-68.04 -64.40
01	129	0.02	0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-5.01	-0.22	1007.07	-04.22			-0.22	-04.40

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 48 (0	Cd)															
	130	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-11.02	-9.52	1074.28	-62.56	-61.57	0.283	-9.52	-62.74
		-0.01		0.00	0.00	-0.011		0.000	0.000			1076.15					-56.52
	132	0.00		0.00	0.00	0.000		0.000	0.000			1079.88					-52.16 -45.29
	133 134	0.01		0.00	0.00 0.00	0.011		0.000 0.000	0.000 0.000	-7.73 -6.47		1081.10 1084.31					-45.29 -40.40
	135	0.00		0.00	0.00	0.000		0.000	0.000			1085.32					-33.31
	136		0.00	0.00	0.00	0.000		0.000	0.000	-4.20		1088.26					-28.14
	137	0.01		0.00	0.00	0.011		0.000	0.000	-3.11		1088.96					-20.74
	138			-0.03	0.00	0.096		0.040	0.004			1091.59					-15.19
	139			-0.02	0.00	0.118		0.029	0.003	-1.87		1092.22	-7.86			-0.54	-7.73
	140 141			-0.02 -0.02	0.01	0.117 0.150		0.030 0.033	-0.007 -0.006	-1.17 -0.70		1094.96 1095.22	-2.53 5.28			$0.07 \\ 0.87$	-2.33 5.54
	142			-0.02	0.01	0.161		0.034	-0.006	-0.32		1097.76	10.82			1.36	11.14
	143			-0.05	0.01	0.227		0.082	0.006	-1.62		1098.47	18.17			1.56	18.72
96	144			-0.04	0.01	0.227		0.069	0.003	-1.07		1100.86	23.85			1.84	24.42
	145			-0.04	0.02	0.249			-0.006	-1.45		1101.41	31.38			1.79	32.04
	146 147			-0.03 -0.02	0.02 0.03	0.260 0.271			-0.008 -0.021	-1.23 -1.55		1103.61 1104.10	37.25 44.83			1.99 1.75	37.97 45.68
100				-0.01	0.02	0.272			-0.014	-1.18		1105.97	51.03			1.92	51.88
101	149	0.25	0.00	0.00	0.02	0.273	0.000	0.029	-0.017	-1.32	1.63	1106.10	58.97			1.71	59.90
102		0.25		0.01	0.02	0.273			-0.020	-1.12		1107.85	65.29			1.85	66.34
103		0.25		0.01	0.02	0.273			-0.020	-1.30		1107.74	73.48			1.64	74.62
104 105		0.25 0.24		0.02 0.03	0.01	0.274	0.000		-0.013 -0.006	-1.02 -1.00		1109.15 1108.79	80.14 88.57			1.78 1.57	81.35 89.88
106		0.23		0.04	0.00			-0.026		-0.75		1109.99	95.44			1.77	96.92
107	155	0.21	0.00	0.05	-0.01	0.230	0.000	-0.043	-0.001	-0.81	1.36	1109.54	103.96			1.49	105.64
108		0.21			-0.01			-0.043		-0.80		1110.59	110.98			1.57	112.81
109		0.20			-0.01			-0.056		-1.18		1109.99	119.66			1.23	121.71
110 111		0.20	0.00		-0.02 -0.02			-0.069 -0.071	0.005 0.005	-1.41 -1.78		1111.09 1110.25	126.63 135.54			1.15 0.76	128.98 138.06
112		0.18			-0.03			-0.073	0.016	-1.87		1111.22	142.63			0.57	145.45
113		0.18			-0.03			-0.085	0.014	-2.61		1110.19	151.74			0.26	154.83
114		0.15			-0.02			-0.076	0.008	-2.29		1110.72	159.28			0.00	162.39
115	163	0.15	0.00	0.07	-0.03	0.164	0.000	-0.077	0.018	-2.99	-1.19	1109.80	168.27			-0.62	171.68
$oldsymbol{Z}$:	= 49 (1	(n)															
43	92	0.04		0.01	0.00			-0.011			-1.81	707.92				-1.81	-3.86
44 45	93 94	0.03		0.01 0.01	0.00 0.00			-0.012 -0.011			-2.81 -3.24		-14.48 -22.14				-14.62 -22.24
46	95	0.03		0.01	0.00			-0.011			-4.42		-32.13				-32.20
47	96	0.04	0.00	0.00	0.00	0.043	0.000	0.001	0.000	-6.44	-5.09	775.62	-39.11			-5.10	-39.16
48	97	0.03		0.01	0.00			-0.012			-6.43		-48.33				-48.35
49	98	0.04		0.01	0.00				-0.000		-7.24		-54.26				-54.58
50 51	99 100	0.02 0.03		0.00	0.00 0.00	0.021 0.032		0.000	0.000 0.000		-8.28 -7.42		-62.01 -65.14	_64 17	0.249	-8.28 -7.42	-62.00
	101	0.03		0.00	0.00			-0.012			-6.41		-69.73	-04.17	0.249		-69.70
	102		0.00	0.01	0.00			-0.011			-5.16		-71.71	-70.71	0.112	-5.16	
	103	0.05	0.00	0.00	-0.01	0.053		0.001	0.010		-4.00		-75.37		0.025	-4.01	
	104		0.00		0.00	0.085		0.015	0.001		-2.95		-76.83			-2.95	
	105 106		0.00 0.00	-0.01 0.00	0.01	0.085 0.107			-0.009 -0.010		-2.09 -1.33		-80.04 -81.11		0.017 0.012	-2.08	-80.01 -81.09
	107														0.012		
	107		0.00 0.00	0.01 0.02	0.01			-0.007 -0.020		-2.05 -1.44	-0.63 -0.13		-83.79 -84.46		0.011		-83.77 -84.45
	109		0.00	0.02				-0.020	0.002	-0.77	0.45		-86.60		0.006		-86.60
	110	0.09		0.02	0.00			-0.021	-0.002	-0.11	0.94		-86.64		0.012		-86.66
	111	0.10			-0.01			-0.032	0.007	0.10	1.29		-88.38		0.005		-88.40
	112	0.10			-0.01			-0.032	0.007	0.54	1.65		-87.96		0.005		-88.00
-04	113	0.08	0.00	0.02	-0.01	0.086	0.000	-0.022	0.008	0.87	1.66	903.10	-89.43	-09.3/	0.003	1.0/	-89.48

N	A	ϵ_2	ϵ_3	ϵ_4	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	E _{mic}	E _{bind}	M _{th}	M _{exp}	σ _{exp}	E _{mic} (MaV)	M _{th} ^{FL}
										(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
	= 49 (114	(In) 0.08	0.00	0.02	-0.01	0.086	0.000	-0.022	0.008	1.10	1.80	070.45	-88.65	QQ 57	0.003	1 91	-88.72
		-0.11				-0.115	0.000	0.005	0.008	0.82	1.83		-89.54		0.003		-89.62
		-0.14				-0.146		-0.003	0.011	0.49	1.87		-88.31		0.004		-88.41
		-0.12 -0.12				-0.125 -0.125		-0.005	0.011	0.38	1.50		-89.04		0.006		-89.15
				0.02				-0.017 -0.017	0.003	0.22		1001.61 1009.97			0.008		-87.66 -87.97
		-0.12 -0.10		0.02		-0.125 -0.105		-0.017 -0.019	0.003 0.002	-0.26 -0.45		1016.24			0.008		-87.97 -86.18
		-0.10		0.03	0.01	-0.104	0.000	-0.031		-1.23		1024.28			0.027		-86.14
		-0.09		0.03		-0.094		-0.032		-1.70		1030.18			0.050		-83.99
		-0.09		0.03		-0.094		-0.032		-2.59		1037.90 1043.54			0.024		-83.64
	124	-0.09 0.04		0.04 0.01	0.02	-0.094 0.043		-0.043 -0.011		-3.44 -4.08		1043.34			0.049 0.030		-81.18 -80.57
	126	0.04		0.01	0.00	0.043		-0.011		-4.99		1056.27			0.040		-77.85
	127	0.01		0.01	0.00	0.011		-0.012		-6.33		1063.62			0.040		-77.12
	128	0.03		0.00	0.00	0.032	0.000	0.000	0.000	-7.49		1068.68			0.049		-74.12
	129 130	0.01 0.02		0.01 0.01	-0.01 0.00	0.011 0.021	0.000 0.000	-0.012 -0.012	0.010 -0.000	-9.11 -10.45		1075.84 1080.74			0.043 0.039		-73.19 -70.03
	131	0.01		0.00	0.00	0.011	0.000	0.000		-11.70		1087.07				-10.15	
	132	0.02		0.00	0.00	0.021	0.000	0.000		-10.81		1089.58		-62.42	0.062		-62.71
	133	0.01		0.00	0.00	0.011	0.000	0.000	0.000	-9.70		1093.37					-58.42
	134 135	0.03 0.02		0.01	0.00	0.032 0.021	0.000 0.000	-0.012 -0.012		-8.51 -7.20		1095.17 1098.41					-52.12 -47.27
	136	0.02		0.00	0.01	0.021	0.000		-0.010	-6.09		1100.01					-40.76
	137	0.03		0.01	0.00	0.032	0.000	-0.012		-4.95		1102.97					-35.64
	138	0.03		0.01	-0.01	0.032	0.000	-0.012	0.009	-3.85		1104.22					-28.76
	139 140	0.04	0.00	0.00 -0.02	0.00	0.043 0.096	0.000	0.001 0.028	0.000 0.002	-2.85 -2.32		1107.03 1108.12					-23.49 -16.44
	141			-0.02	0.00	0.090	0.000	0.028	0.002	-2.52 -1.65		1110.83					-10.44 -11.03
93	142			-0.01	0.01	0.118	0.000	0.018	-0.008	-1.02	0.11	1111.81	-4.02			0.13	-3.90
	143			-0.01	0.01	0.118	0.000	0.018	-0.008	-0.47		1114.43	1.44			0.60	1.62
	144 145			-0.05 -0.04	0.01	0.216 0.216	0.000 0.000	0.080 0.067	0.005 0.002	-1.74 -1.18		1114.99 1117.46	8.94 14.55			1.49 1.75	9.34 14.97
	146			-0.04	0.01	0.210	0.000	0.007	-0.002	-1.72		1117.40	21.44			1.60	21.96
	147	0.23	0.00	-0.03	0.02	0.249	0.000		-0.009	-1.29	1.67	1120.87	27.28			1.81	27.84
	148			-0.02	0.02	0.260	0.000		-0.011	-1.52		1121.75	34.47			1.61	35.07
100				-0.01	0.02	0.272	0.000		-0.014	-1.38		1123.72	40.57			1.82	41.24
101	150 151	0.25 0.25		0.00 0.01	0.02	0.273 0.273	0.000 0.000		-0.017 -0.020	-1.51 -1.32		1124.41 1126.21	47.95 54.22			1.57 1.70	48.70 55.08
	152	0.25		0.02	0.01	0.274	0.000		-0.013	-1.45		1126.55	61.95			1.49	62.84
104	153	0.25	0.00	0.02	0.01	0.274	0.000	0.004	-0.013	-1.25	1.58	1128.08	68.50			1.61	69.50
	154	0.23		0.03	0.00	0.252		-0.014		-1.12		1128.25	76.40			1.37	77.50
	155 156	0.23 0.23		0.04	0.00 -0.01	0.252 0.253		-0.026 -0.039		-1.03 -1.29		1129.49 1129.43	83.22 91.36			1.57 1.36	84.49 92.78
108		0.21			-0.01	0.230		-0.043		-1.04		1130.61	98.25			1.36	99.83
109	158	0.21	0.00	0.06	-0.02	0.230	0.000	-0.056	0.006	-1.52	0.85	1130.46	106.47			1.08	108.29
	159	0.20			-0.02	0.219		-0.057	0.007	-1.37		1131.40	113.60			1.07	115.59
111 112	160 161	0.18 0.15			-0.02 -0.01	0.197 0.163		-0.060 -0.051	0.008 0.002	-1.62 -1.38		1131.10 1131.80	121.97 129.35			0.63 0.51	124.13 131.56
	162	0.15			-0.01 -0.02	0.163		-0.051 -0.064	0.002	-1.36 -2.11		1131.47	137.74			0.00	140.26
114		0.15		0.06	-0.02	0.163	0.000	-0.064	0.010	-2.43		1132.25	145.04			-0.31	147.73
	164	0.15			-0.03	0.164		-0.077	0.018	-3.32		1131.88	153.48			-0.91	156.56
116	165 166	0.11 0.11			-0.02 -0.02	0.119 0.119		-0.056 -0.056	0.014 0.014	-3.20 -4.05		1132.54 1131.95	160.89 169.55			-1.58 -2.38	163.90 172.74
			0.00	0.05	0.02	0.117	0.000	0.050	U.U1 4	+.∪3	2.00	1131.73	109.33			2.30	1/4./4
	= 50 (94		0.00	0.00	0.00	0.000	0.000	0.000	0.000	5 04	2 05	726.00	6 50			2 05	6.60
44 45	94	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.24 -5.65	-3.85 -4.28	726.09 741.96	-6.50 -14.31				-6.62 -14.39
46		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-6.88	-5.46		-25.08				-25.14

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	EFL mic (MeV)	M ^{FL} (MeV)
Z:	= 50 ((Sn)															
47		-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-7.57	-6.16	776.03	-32.23			-6.16	-32.27
48	98	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.06	-7.53	794.13	-42.26			-7.53	-42.28
49	99	0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-9.84	-8.24	808.48	-48.53			-8.24	-48.54
	100		0.00		0.00		0.000	0.000		-11.12	-9.44		-57.50	-56.78	0.705		-57.49
51	101	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-10.04	-8.50	836.79	-60.71			-8.50	-60.69
52	102		0.00		0.00	0.000		0.000	0.000	-8.96	-7.53		-66.07	-64.93	0.132		-66.04
	103	0.00			0.00	0.000		0.000	0.000	-7.51	-6.24		-68.16				-68.13
	104		0.00		0.00	0.000		0.000	0.000	-6.20	-5.07		-72.54		0.104		-72.50
	105 106		0.00 0.00		0.00	0.000	0.000	0.000 0.000	0.000 0.000	-5.04 -3.96	-4.03 -3.04		-74.14 -77.97		0.081		-74.11 -77.94
	107		0.00		0.00	0.000		0.000	0.000	-3.00	-2.15		-79.03		0.083		-79.00
	108 109		0.00 0.00		0.00 0.00	0.064	0.000	0.002 -0.009	0.000 -0.001	-2.21 -1.70	-1.22 -0.62		-82.20 -82.88		0.020 0.010		-82.18 -82.88
	110		0.00		0.00		0.000	0.009	0.000	-0.90	-0.02 -0.18		-85.87		0.010		-85.87
	111	-0.01		-0.01		-0.010		0.012	-0.000	-0.47	0.26		-86.09		0.007		-86.10
	112	0.00			0.00	0.000		0.000	0.000	-0.19	0.51		-88.62		0.004		-88.65
	113		0.00		0.00		0.000	-0.012	-0.000	-0.19	0.87		-88.31		0.004		-88.35
	114	0.00			0.00	0.000		0.000	0.000	0.26	0.89		-90.45		0.003		-90.51
65	115	0.02	0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	0.52	1.12		-89.70		0.003	1.12	-89.78
66	116	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.37	0.96	988.60	-91.45	-91.53	0.003	0.95	-91.54
67	117	-0.07	0.00	0.00	0.00	-0.073	0.000	0.002	-0.000	0.31	1.09	995.47	-90.24	-90.40	0.003	1.09	-90.36
68	118	-0.09	0.00	0.00	0.00	-0.094	0.000	0.003	-0.000	-0.15	0.81	1004.84	-91.54	-91.66	0.003	0.81	-91.67
		-0.10				-0.105		-0.008	0.001	-0.37		1011.48			0.003	0.65	-90.26
	120	-0.08				-0.084		-0.009	0.001	-0.74		1020.54			0.003		-91.26
71	121	-0.09	0.00	0.01	0.00	-0.094	0.000	-0.008	0.001	-1.12	-0.14	1026.80	-89.29	-89.20	0.002	-0.14	-89.46
	122		0.00		0.00	0.000		0.000	0.000	-1.62		1035.63			0.003		-90.24
	123		0.00		0.00	0.000		0.000	0.000	-2.10		1041.59			0.003		-88.14
	124		0.00		0.00	0.000		0.000	0.000	-3.20		1050.10			0.001		-88.60
	125 126	0.00	0.00		0.00 0.00	0.000	0.000	0.000 0.000	0.000 0.000	-3.88 -5.16		1055.79 1064.02			0.002 0.011		-86.23 -86.39
																	-83.79
	127 128	-0.01	0.00		0.00	-0.011 0.000		0.000 0.000	0.000 0.000	-6.05 -7.51		1069.47 1077.42			0.025 0.027		-83.79 -83.67
	129	-0.00				-0.011		0.000	0.000	-7.51 -8.61		1077.42			0.027		-80.83
	130	0.01				0.011		0.000		-10.24		1090.31			0.011		-80.41
	131		0.00		0.00							1095.15					
82	132	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-12.82	-11.22	1102.23	-75.94	-76.55	0.014	-11.22	-76.20
	133	-0.01			0.00			0.000				1104.73				-10.33	
84	134	0.00	0.00		0.00	0.000		0.000		-10.73		1109.09			0.100	-9.31	-66.89
85	135	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.42	-8.12	1110.91	-60.40			-8.12	-60.63
86	136	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.13	-6.91	1114.71	-56.13			-6.91	-56.34
	137	0.00			0.00	0.000		0.000	0.000	-6.97		1116.30					-49.85
	138		0.00		0.00		0.000	0.000	0.000	-5.79		1119.84					-45.28
	139		0.00		0.00	0.000		0.000	0.000	-4.65		1121.11					-38.46
	140		0.00		0.00	0.000		0.000	0.000	-3.62		1124.43					-33.68
	141		0.00		0.00		0.000	-0.012	0.000	-2.53		1125.39					-26.52
	142		0.00		0.00	0.000		0.000	0.000	-1.72		1128.62					-21.65
	143 144			-0.02 -0.02		0.075		0.026	0.002 0.002	-1.12		1129.62				-0.35 0.20	-14.51
	144			-0.02 -0.05		0.096	0.000	0.028 0.080	0.002	-0.65 -2.04		1132.70 1133.21	-9.55 -1.99			1.20	-9.47 -1.69
	145			-0.05			0.000		-0.003	-2.04 -1.89		1135.21	3.07			1.53	3.46
	147			-0.04			0.000		-0.007	-1.68		1137.45	9.91			1.30	10.31
	147			-0.04 -0.03			0.000		-0.007 -0.009	-1.68 -1.53		1137.45	15.32			1.61	10.31
	149			-0.03 -0.02			0.000		-0.009 -0.011	-1.72		1140.12	22.51			1.46	22.98
100				-0.02			0.000		-0.011	-1.40		1143.52	28.06			1.64	28.60
101				-0.01			0.000		-0.014	-1.59		1144.21	35.44			1.44	36.06
102			0.00	0.00			0.000		-0.017	-1.34		1146.46	41.26			1.62	41.97
103			0.00	0.01			0.000		-0.020	-1.66		1146.90	48.89			1.41	49.69

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	50 /	·(C)															
	= 50 (154	(Sn) 0.24	0.00	0.02	0.01	0.262	0.000	0.002	-0.013	-1.23	1.40	1148.88	54.99			1.54	55.84
104		0.24		0.02	0.01	0.262	0.000		-0.013	-1.25 -1.36		1148.97	62.97			1.42	63.91
	156	0.23		0.03	0.00	0.252	0.000	-0.014		-0.99		1150.71	69.30			1.57	70.34
107		0.23	0.00	0.04	0.00	0.252		-0.026	-0.009	-1.19		1150.62	77.46			1.42	78.64
108	158	0.21	0.00	0.04	-0.01	0.229	0.000	-0.031	0.001	-0.85	1.36	1152.25	83.90			1.45	85.23
109		0.21			-0.01	0.230		-0.043	-0.001	-1.24		1152.08	92.14			1.16	93.64
110		0.18			-0.01	0.196		-0.035	0.002	-0.71		1153.45	98.84			1.15	100.44
111 112		0.18	0.00		-0.02 -0.01	0.196 0.163		-0.048 -0.039	0.010 0.003	-1.29 -1.09		1153.04 1154.41	107.33 114.03			0.94 0.63	109.17 115.92
113		0.15			-0.01	0.163		-0.059 -0.051	0.003	-1.09 -1.76		1154.02	122.49			0.03	124.59
114		0.11		0.03	0.00	0.119		-0.031	-0.004	-1.73		1155.46	129.11			-0.50	131.27
115			0.00		-0.00	0.119		-0.031 -0.043	0.004	-1.73 -2.54		1155.02	137.63			-0.30 -1.14	140.02
116			0.00		-0.01	0.108		-0.044	0.005	-3.05		1156.29	144.44			-1.69	147.00
117		0.10	0.00	0.04	-0.01	0.108	0.000	-0.044	0.005	-3.92	-2.66	1155.73	153.06			-2.51	155.80
118	168	0.10	0.00	0.04	-0.02	0.108	0.000	-0.045	0.015	-4.46	-3.22	1156.79	160.08			-2.99	163.08
119	169	0.08	0.00	0.03	-0.01	0.086	0.000	-0.034	0.007	-5.15	-4.01	1156.01	168.93			-3.91	171.99
\boldsymbol{Z}	= 51 ((Sb)															
46	97	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-5.26	-4.10	755.45	-12.43			-4.10	-12.48
47	98			-0.01	0.00	0.021	0.000	0.012	0.000	-5.95	-4.76		-20.31				-20.33
48	99			-0.01	0.00	0.011	0.000	0.012	0.000	-7.36	-6.06		-30.41				-30.42
	100 101			-0.01 -0.01	0.00	0.032 0.011	0.000 0.000	0.012 0.012	0.000 0.000	-8.19 -9.37	-6.78 -7.90		-37.45 -46.48				-37.44 -46.46
	102 103			-0.02 -0.01	-0.01 -0.01	0.032 0.021	0.000 0.000	0.024 0.012	0.011	-8.41 -7.24	-6.98 -6.03		-50.75 -56.57				-51.01 -56.53
	104			-0.04	0.00	0.075	0.000	0.051	0.004	-6.25	-4.61		-59.25				-59.21
	105	0.08	0.00	-0.04	-0.01	0.086	0.000	0.051	0.015	-5.20	-3.51		-63.85	-63.82	0.105		-63.80
55	106	0.10	0.00	-0.04	0.00	0.107	0.000	0.053	0.006	-4.40	-2.57	881.94	-66.28			-2.57	-66.24
	107	0.11	0.00	-0.03	0.01	0.117	0.000	0.042	-0.005	-3.40	-1.70		-70.35			-1.70	-70.31
	108			-0.03	0.01	0.117	0.000	0.042	-0.005	-2.61	-0.99		-72.30				-72.27
	109			-0.02	0.01	0.128	0.000	0.031		-1.87	-0.32		-75.85	-76.26	0.019		-75.83
	110 111	0.11	0.00	-0.01 0.00	0.00	0.118 0.118	0.000	0.017 0.005	0.002 0.000	-1.08 -0.46	0.18 0.68		-77.34 -80.39	_80.89	0.028		-77.33 -80.39
	112		0.00	0.00	0.00	0.118	0.000	0.005	0.000	0.40	1.11		-81.31		0.028		-81.32
	113		0.00		-0.00	0.118	0.000	0.003	0.000	0.03	1.11		-81.31 -83.96		0.018		-81.32 -83.98
				-0.01		-0.135	0.000	0.018	-0.002	0.48	1.90		-84.15		0.028		-84.19
					-0.01	-0.135	0.000	0.019	0.008	0.45	1.88		-86.45		0.016		-86.50
65	116	-0.13	0.00	-0.01	-0.01	-0.135	0.000	0.019	0.008	0.46	1.94	982.91	-86.54	-86.82	0.006	1.95	-86.61
66	117	-0.14	0.00	-0.01	-0.01	-0.145	0.000	0.020	0.007	0.17	1.79		-88.38		0.009		-88.46
		-0.15				-0.156	0.000	0.010	0.018	-0.04		1000.56			0.004		-88.15
		-0.14				-0.146	0.000	0.008	0.009	-0.14		1010.04			0.008		-89.57
		-0.14 -0.12		0.00		-0.146 -0.125	0.000 -0.013	0.008 -0.006	0.009 0.001	-0.26 -0.52		1017.27 1026.48			0.008 0.002		-88.76 -89.91
		-0.12		0.02		-0.125		-0.017	0.001	-0.86		1033.41			0.002		-88.79
		-0.12 -0.11		0.02		-0.125 -0.115		-0.017 -0.018	0.003	-0.80 -1.42		1033.41			0.002		-89.52
		-0.10		0.02		-0.105		-0.019		-1.85		1048.81			0.002		-88.07
74	125	-0.10	0.00	0.02	0.01	-0.105	0.000	-0.019	-0.007	-2.74		1057.28			0.003	-1.48	-88.48
75	126	-0.10	0.00	0.03	0.01	-0.104	0.000	-0.031	-0.006	-3.52	-2.16	1063.60	-86.51	-86.40	0.032	-2.14	-86.73
76	127	-0.05	0.00	0.00	0.00	-0.052	0.000	0.001	0.000	-4.20	-3.28	1071.89	-86.73	-86.70	0.005	-3.28	-86.99
		-0.04		0.00		-0.042	0.000	0.001	0.000	-5.06		1077.97			0.025		-85.01
		-0.03		0.00		-0.032	0.000	0.000	0.000	-6.43		1085.96			0.021		-84.94
		-0.03 -0.02		0.00		-0.032 -0.021	0.000	0.000	0.000	-7.54 -9.17		1091.79 1099.55			0.017 0.021		-82.71 -82.40
	132 133	0.03 -0.01		0.00		0.032 -0.011	0.000 0.000	0.000 0.000		-10.33 -11.64		1104.86 1111.99			0.014 0.025	-8.90 -10.17	-79.63 -78.69
		-0.01 -0.02				-0.011	0.000	0.000	-0.000			1111.99			0.023		-73.84
		-0.02		0.00		-0.021	0.000	0.000	0.000	-9.60		1119.55			0.103		-70.10
85	136	0.02	0.00	-0.01	0.00	0.021	0.000	0.012	0.000	-8.33	-7.13	1121.96	-64.16			-7.12	-64.43

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E_{s+p}	$E_{ m mic}$	$E_{\rm bind}$	$M_{ m th}$	$M_{\rm exp}$	$\sigma_{ m exp}$	$E_{ m mic}^{ m FL}$	$M_{ m th}^{ m FL}$
	51	(CL)								(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
	= 51 (` '	0.00	0.01	0.00	0.021	0.000	0.010	0.000	5 06	5.05	1125.00	60.01			5.05	60. 25
		-0.02				-0.021						1125.88					-60.27
	138	-0.03				-0.032		0.012				1128.03					-54.33
	139			-0.03			0.000	0.037				1131.77					-49.88
	140						0.000	0.038	0.023			1133.72					-43.74
90	141	0.09	0.00	-0.04	-0.01	0.097	0.000	0.052	0.015	-3.61	-2.13	1137.17	-39.02			-2.03	-39.09
91	142	0.10	0.00	-0.04	0.00	0.107	0.000	0.053	0.006	-2.86	-1.40	1138.96	-32.74			-1.31	-32.80
92	143	0.11	0.00	-0.04	0.00	0.118	0.000	0.054	0.006	-2.23	-0.72	1142.29	-27.99			-0.62	-28.02
93	144	0.13	0.00	-0.04	0.00	0.140	0.000	0.056	0.007	-1.74	-0.00	1143.77	-21.40			0.09	-21.39
94	145	0.15	0.00	-0.05	0.00	0.161	0.000	0.071	0.011	-1.71	0.52	1146.92	-16.48			0.69	-16.35
95	146	0.20	0.00	-0.05	0.01	0.216	0.000	0.080	0.005	-2.30	0.86	1148.48	-9.96			1.02	-9.79
96	147	0.20	0.00	-0.05	0.01	0.216	0.000	0.080	0.005	-1.97	1.14	1151.55	-4.97			1.32	-4.72
	148			-0.04	0.02		0.000	0.070	-0.007	-1.92		1153.32	1.34			1.11	1.60
98	149	0.21	0.00	-0.04	0.02	0.226	0.000	0.070	-0.007	-1.63		1156.13	6.59			1.36	6.93
99	150	0.23	0.00	-0.02	0.02	0.249	0.000		-0.012	-1.67		1157.37	13.43			1.34	13.76
100	151			-0.02	0.02		0.000	0.045	-0.013	-1.12	1.39	1159.98	18.89			1.50	19.30
101				-0.01	0.02		0.000		-0.015			1161.07	25.87			1.39	26.33
101			0.00	0.00	0.02		0.000		-0.013	-1.32 -1.25		1163.38	31.63			1.55	32.17
102			0.00	0.00	0.02		0.000		-0.010			1164.31	38.77			1.36	39.40
103			0.00	0.01	0.02		0.000		-0.020 -0.011			1166.29	44.86			1.52	45.52
105			0.00	0.01	0.01		0.000		-0.011			1166.98	52.24			1.34	53.02
106			0.00	0.03	0.00				-0.006			1168.74	58.55			1.48	59.41
107			0.00	0.04	0.00				-0.009			1169.14	66.23			1.33	67.21
108			0.00	0.04	-0.01			-0.031	0.001	-0.98		1170.81	72.63			1.36	73.75
109			0.00		-0.01			-0.031	0.001	-1.22		1171.04	80.47			1.10	81.69
110	161	0.18	0.00	0.04	-0.01	0.196	0.000	-0.035	0.002	-0.80	1.00	1172.50	87.08			1.09	88.45
111	162	0.18	0.00	0.05	-0.02	0.196	0.000	-0.048	0.010	-1.34	0.52	1172.73	94.93			0.71	96.52
112	163	0.15	0.00	0.03	-0.01			-0.027	0.005	-0.99	0.64	1173.80	101.93			0.70	103.53
113	164		0.00	0.04	-0.01			-0.039	0.003	-1.62	0.09	1173.86	109.93			0.19	111.72
	165	-0.14	0.00	0.02	-0.01			-0.015	0.012	-1.79	-0.46	1175.37	116.50			-0.40	118.39
115	166	0.11	0.00	0.02	0.00	0.118	0.000	-0.019	-0.002	-2.23	-1.04	1175.26	124.68			-1.02	126.68
116	167	0.11	0.00	0.03	-0.01	0.119	0.000	-0.032	0.006	-2.85	-1.59	1176.53	131.48			-1.51	133.70
117			0.00	0.04	-0.01	0.108	0.000	-0.044	0.005	-3.75		1176.50	139.58			-2.33	142.02
118	169	0.10	0.00		-0.02	0.108	0.000	-0.045	0.015			1177.59	146.56			-2.83	149.25
119	170		0.00	0.04	-0.02	0.108	0.000	-0.045	0.015	-5.37	-4.30	1177.73	154.49			-4.08	157.36
120	171	0.08	0.00	0.02	-0.01	0.086	0.000	-0.022	0.008	-5.46	-4.45	1178.19	162.11			-4.40	165.00
121	172	-0.06	0.00	0.01	0.00	-0.063	0.000	-0.010	0.001	-6 49	-5.70	1178.12	170.25			-5.70	173.27
121	1,2	0.00	0.00	0.01	0.00	0.005	0.000	0.010	0.001	0.15	5.70	1170.12	170.23			3.70	173.27
\boldsymbol{Z}	= 52 ((Te)															
47	99	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-4.73	-3.71	768.49	-10.12			-3.71	-10.11
48	100	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.13	-4.98	787.40	-20.95			-4.98	-20.93
49	101	0.02	0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-6.92	-5.66	802.61	-28.09			-5.66	-28.06
50	102	0.00	0.00	0.00	0.00		0.000	0.000	0.000	-8.09	-6.75	820.43	-37.84			-6.75	-37.80
51	103	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-6.99	-5.82	833.20	-42.54			-5.83	-42.49
52	104	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.87	-4.85	848.09	-49.36			-4.85	-49.31
	105			-0.04	-0.01		0.000	0.051		-5.16			-52.23				-52.17
	106			-0.05			0.000	0.066		-4.54			-57.53	-58.21	0.132	-2.35	
	107			-0.05	0.01		0.000		-0.002				-60.24				-60.18
	108			-0.04	0.01		0.000		-0.003				-65.09	-65.72	0.104	-0.76	
	109			-0.03	0.01		0.000		-0.005				-67.17		0.063		-67.13
	110			-0.03	0.01		0.000		-0.004		0.52		-71.52		0.053		-71.48
	111			-0.03	0.01		0.000		-0.003		1.14		-73.02		0.071		-72.99
	112			-0.04	0.01		0.000		-0.000		1.58		-76.82		0.170		-76.79
	113			-0.04	0.00		0.000	0.063		-0.50	1.85		-78.02		0.028		-78.00
62	114	0.18	0.00	-0.03	0.00		0.000	0.051	0.008	-0.01	2.03	960.87	-81.42	-81.89	0.028		-81.42
63	115	0.19	0.00	-0.03	0.00		0.000	0.052	0.009	0.03	2.27		-82.03		0.028	2.29	-82.05
64	116			-0.02	0.00		0.000	0.042	0.007	0.19	2.43		-84.83		0.028	2.45	-84.86
	117			-0.01			0.000	0.029	0.014	0.32	2.50		-85.01		0.013		-85.07
66	118	-0.16	0.00	-0.01	-0.02	-0.165	0.000	0.023	0.016	0.70	2.56	999.04	-87.31	-87.72	0.015	2.59	-87.38

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 52 (Te)															
		-0.17	0.00	0.00	-0.02	-0.176	0.000	0.012	0.018	0.44	2.30	1007.07	-87.27	-87.18	0.008	2.32	-87.36
		-0.17				-0.176	0.000	0.012	0.018	0.20	2.18	1017.05	-89.18	-89.40	0.010		-89.28
69	121	-0.17	0.00	0.00	-0.02	-0.176	0.000	0.012	0.018	0.05	1.85	1024.60	-88.65	-88.55	0.026	1.88	-88.78
		-0.16		0.01		-0.166	0.000	-0.001	0.010	-0.11		1034.11			0.001	1.67	-90.24
71	123	-0.14	0.00	0.01	-0.01	-0.146	0.000	-0.003	0.011	-0.14	1.36	1041.12	-89.03	-89.17	0.001	1.37	-89.20
		-0.12		0.01	0.00	-0.125	-0.013	-0.006	0.001	-0.54		1050.51			0.001		-90.55
		-0.12		0.02		-0.125		-0.017	0.003	-1.05		1057.21			0.001		-89.19
		-0.10		0.02		-0.105		-0.019	0.002	-1.74		1066.31			0.001		-90.24
		-0.10		0.02		-0.105		-0.019				1072.70			0.002	-1.20	
		-0.09		0.02		-0.094		-0.020				1081.45			0.002	-2.15	
	129	-0.09		0.02		-0.094	0.000	-0.020		-4.24		1087.58			0.002	-2.99	
	130 131	0.00		0.00	0.00	0.000	0.000 0.000	0.000 0.000	0.000 -0.010			1096.40 1102.20			0.002 0.002	-4.50 -5.44	
	132	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1110.68				-7.04	
	133	0.02		0.01	0.00	0.021	0.000	-0.012	-0.000			1116.03				-7.94	
	134	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1123.77			0.011	-9.23	
	135	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000			1127.00			0.090	-8.42	
	136	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.61		1132.02			0.045	-7.40	-75.32
85	137	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-7.26	-6.18	1134.46	-69.37	-69.56	0.122	-6.18	-69.68
86	138	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.96	-5.00	1138.92	-65.76			-5.00	-66.07
87	139	0.08	0.00	-0.05	-0.02	0.087	0.000	0.064	0.026	-5.82	-3.91	1141.12	-59.89			-3.74	-60.02
88	140	0.09	0.00	-0.05	-0.01	0.097	0.000	0.064	0.017	-4.80	-2.95	1145.43	-56.13			-2.81	-56.27
	141			-0.05	0.00	0.118	0.000	0.066	0.008	-4.13		1147.56					-50.33
	142			-0.05	0.00	0.118	0.000	0.066	0.008	-3.37		1151.81					-46.47
91	143			-0.05	0.01	0.150	0.000	0.070	-0.000	-3.03	-0.79	1153.70	-40.19			-0.65	-40.26
	144			-0.06	0.01	0.161	0.000	0.084	0.003	-2.82		1157.70					-36.10
	145			-0.07	0.01	0.194	0.000	0.102	0.009	-3.32		1159.61					-29.83
	146 147			-0.06 -0.06	0.01	0.194 0.205	0.000 0.000	0.089	0.006 0.007	-2.52 -2.58		1163.38 1165.39					-25.53 -19.44
	148			-0.06 -0.05	0.01	0.203	0.000		-0.007	-2.38 -2.09		1163.39					-19.44 -14.92
	149 150			-0.05 -0.04	0.02	0.226 0.226	0.000 0.000		-0.004 -0.007	-2.26 -1.73		1170.57 1173.86	-8.62 -3.84			1.05 1.30	-8.41 -3.61
	151			-0.03	0.02	0.227	0.000		-0.010	-1.59		1175.21	2.88			1.24	3.12
100				-0.03	0.02	0.227	0.000		-0.010			1178.26	7.90			1.48	8.22
101		0.23	0.00	-0.01	0.02	0.250	0.000		-0.015	-1.56		1179.35	14.87			1.39	15.22
102	154	0.24	0.00	0.00	0.03	0.261	0.000	0.028	-0.027	-1.58	1.35	1182.29	20.02			1.55	20.53
103		0.24		0.01	0.02	0.262	0.000		-0.020	-1.64		1183.17	27.20			1.34	27.69
104	156	0.24		0.02	0.02	0.263	0.000		-0.023	-1.46	1.38	1185.73	32.71			1.51	33.32
105		0.23		0.02	0.01	0.251	0.000	-0.001		-1.35		1186.35	40.17			1.34	40.78
106	158	0.23	0.00	0.03	0.01	0.252	0.000	-0.013	-0.016	-1.18	1.41	1188.66	45.93			1.49	46.67
107		0.23		0.04	0.00	0.252		-0.026		-1.34		1189.02	53.63			1.38	54.46
108		0.21		0.03	0.00	0.229		-0.018		-0.85		1191.13	59.60			1.40	60.50
109		0.21 0.20		0.04	0.00	0.230		-0.030		-1.16		1191.39 1193.25	67.41			1.20 1.26	68.45
110 111		0.20			-0.01 -0.01	0.218 0.196		-0.032 -0.035	0.002 0.002	-0.90 -0.99		1193.23	73.62 81.60			0.95	74.79 82.89
112 113		0.17 0.15			-0.01 -0.01	0.185 0.162		-0.037 -0.027	0.003 0.005	-0.99 -1.20		1194.92 1194.92	88.10 96.16			1.04 0.55	89.52 97.67
113		0.15			-0.01	0.162		-0.027 -0.039	0.003			1194.92	102.31			0.33	104.01
	167			0.04	0.00			-0.039 -0.025	0.005			1196.82	110.41			-0.60	112.19
116		0.11			-0.01	0.119		-0.032	0.006			1198.49	116.81			-1.04	118.77
117		0.11			-0.01	0.119	0.000	-0.043	0.005			1198.46	124.91			-1.85	127.07
118		0.11			-0.02	0.119		-0.044	0.015			1199.96	131.48				133.88
119		0.10			-0.02	0.108		-0.045	0.015			1199.72	139.79				142.36
		-0.12		0.01		-0.125		-0.006	0.001			1200.93	146.65				149.18
121	173	-0.07	0.00	0.01	0.00	-0.073	0.000	-0.010	0.001	-5.81	-4.99	1200.81	154.85			-4.98	157.56
122	174	-0.06	0.00	0.02	0.01	-0.063	0.000	-0.022	-0.008	-6.72	-5.87	1202.23	161.50			-5.81	164.45
123	175	-0.06	0.00	0.02	0.01	-0.063	0.000	-0.022	-0.008	-8.08	-7.11	1201.99	169.81			-7.05	172.95

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	β_6	E_{s+p}	$E_{\rm mic}$	$E_{\rm bind}$	$M_{ m th}$	$M_{\rm exp}$	$\sigma_{\rm exp}$	$E_{ m mic}^{ m FL}$	$M_{ m th}^{ m FL}$
										(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
	= 52 (` ′															
124	176	-0.04	0.00	0.01	0.00	-0.042	0.000	-0.011	0.001	-8.85	-7.82	1203.04	176.83			-7.81	180.11
	= 53 (
	101 102	0.01	0.00	0.00	0.00	0.011 0.032	0.000 0.000	0.000 -0.012	0.000 -0.000	-4.57	-3.66 -4.31	781.84	-8.10 -15.96				-8.05 -15.90
	102		0.00	0.00	0.00	0.000	0.000	0.000		-6.45			-15.90 -25.77				-15.90 -25.70
	104			-0.03		0.054	0.000	0.037	0.022	-5.82	-4.48	829.23	-31.27			-4.47	-31.20
	105			-0.05	-0.02	0.087	0.000	0.064		-5.31			-38.16				-38.07
	106			-0.05	0.00	0.129	0.000	0.068	0.009		-2.33		-42.31				-42.52
	107 108			-0.05 -0.05	0.01 0.02		-0.041 -0.068		-0.001 -0.009		-1.59 -0.86		-48.40 -51.88				-48.32 -51.81
	109			-0.04	0.02		-0.082		-0.009		-0.18		-56.98	-57.61	0.104		-56.91
57	110	0.16	0.06	-0.03	0.02	0.173	-0.082	0.049	-0.011	-2.37	0.52	906.16	-59.78			0.51	-59.73
	111			-0.03	0.02		-0.082		-0.011		1.01		-64.34				-64.29
	112 113			-0.03 -0.04	0.02		-0.055 -0.027		-0.011 -0.009	-1.03 -0.79	1.22 1.64		-66.94 -70.89	_71 13	0.053		-66.91 -70.85
	114			-0.04	0.02		-0.027 -0.028	0.067	0.002	-0.79 -0.63	2.00		-70.69 -72.67	-/1.13	0.055		-70.65 -72.66
62	115	0.20	0.00	-0.03	0.01	0.216	0.000	0.055	-0.001	-0.09	2.26	962.85	-76.11	-76.34	0.029	2.28	-76.11
	116			-0.02	0.01	0.227	0.000		-0.003	0.02	2.42		-77.48		0.097		-77.50
	117			-0.01	0.00	0.228	0.000	0.031	0.004	0.24	2.54		-80.43		0.028		-80.46
	118 119	0.22	0.00	0.00	0.00	0.239 0.239	0.000 0.000	0.021	0.002 -0.001	0.16 0.23	2.60	1002.77	-81.29 -83.75		0.020 0.028		-81.36 -83.82
	120	0.22		0.01	0.00	0.239	0.000	0.009	-0.001	0.10		1011.19			0.018		-84.20
68	121	-0.18	0.00	0.00	-0.02	-0.186	0.000	0.014	0.018	0.48	2.44	1021.32	-86.15	-86.29	0.010	2.46	-86.26
		-0.19				-0.196	0.000	0.016	0.027	0.11		1029.46			0.005		-86.33
	123 124	-0.18 0.17		0.01	-0.02 0.00	-0.187 0.183	0.000 0.000	0.002 0.012	0.020 0.001	0.05 -0.03		1039.10 1046.70			0.004 0.002		-87.93 -87.51
		-0.17				-0.166	0.000	-0.0012	0.001	-0.03 -0.34		1056.00			0.002		-87.31 -88.74
	126	0.15		0.00	0.00	0.162	0.000	0.009	0.001	-0.76		1062.97			0.004		-87.67
74	127	-0.12	0.00	0.02		-0.125	0.000		-0.007	-1.11		1071.96			0.004		-88.59
		-0.12		0.02		-0.125		-0.018		-1.78		1079.01			0.004		-87.60
		-0.11 -0.12		0.02		-0.115 -0.125		-0.019 -0.029		-2.56 -3.64		1087.96 1094.67			0.003	-1.22 -2.02	-88.48 -87.12
	131		0.00	0.00	0.01		0.000					1103.32				-3.28	
	132	0.03		0.00	0.01	0.032	0.000					1109.86				-4.37	
	133	0.02		0.00	0.01	0.021	0.000					1118.24				-5.78	
	134 135	0.03		0.01	0.00	0.032	0.000 0.000	-0.012 0.000				1124.22 1131.99				-6.73 -7.98	
	136		0.00		0.00	0.032	0.000	0.000				1135.76				-7.12	
	137	0.03		0.00	0.00	0.032	0.000	0.000				1140.89			0.028	-6.13	
85	138	0.03		0.00	0.01	0.032	0.000	0.001				1143.98			0.082	-4.98	-71.94
	139			-0.05 -0.05	-0.01	0.097	0.000	0.064				1148.42		-68.84	0.031		-68.19
	140141				0.00	0.107	0.000	0.065				1151.51					-63.23
	141			-0.05 -0.05	0.00	0.118	0.000 -0.097	0.066 0.070	0.008			1156.02 1158.85					-59.65 -54.33
	143			-0.05	0.01		-0.083	0.071	0.003			1163.21					-50.61
	144			-0.05	0.01		-0.097	0.072	0.004			1165.90					-45.19
	145			-0.06	0.01	0.172	0.000	0.086				1170.17					-41.36
	146 147			-0.06 -0.06	0.01	0.194 0.194	0.000 0.000	0.089	0.006	-2.81 -2.38		1172.50 1176.67					-35.59 -31.64
	147			-0.06 -0.05	0.01	0.194	0.000	0.089	-0.005			1170.07					-31.04 -25.92
96	149	0.20	0.00	-0.05	0.02	0.215	0.000	0.080	-0.005	-2.04	0.90	1182.71	-21.55			1.09	-21.49
97	150			-0.04	0.02	0.226	0.000		-0.007			1184.81				1.10	-15.52
	151			-0.04	0.03	0.226	0.000		-0.018			1188.30					-10.81
99 100	152 153			-0.03 -0.02	0.03	0.226 0.227	0.000 0.000		-0.020 -0.013			1190.22 1193.24	-4.84 0.20			1.23 1.44	-4.65 0.37
101				-0.01	0.02	0.250	0.000		-0.025			1194.97	6.55			1.35	6.84
102	155	0.24	0.00	0.00	0.03	0.261	0.000	0.028	-0.027	-1.65	1.31	1197.87	11.72			1.49	12.09

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 53 ((I)															
	156	0.24	0.00	0.01	0.03	0.262	0.000	0.016	-0.030	-1.85	1.10	1199.38	18.29			1.28	18.73
104	157	0.24	0.00	0.02	0.02	0.263	0.000	0.003	-0.023	-1.55	1.33	1201.89	23.85			1.44	24.30
	158	0.23		0.02	0.02	0.251	0.000		-0.023	-1.55		1203.08	30.72			1.25	31.24
	159	0.23		0.03	0.01	0.252		-0.013		-1.30		1205.37	36.51			1.40	37.08
	160	0.23		0.04	0.00	0.252		-0.026		-1.47		1206.22	43.72			1.29	44.37
	161 162	0.21 0.21		0.03 0.04	0.00	0.229 0.230		-0.018 -0.030		-0.98 -1.29		1208.38 1209.11	49.64 56.98			1.31 1.12	50.36 57.83
	163	0.21		0.04	0.00	0.230		-0.030 -0.031		-1.29 -1.02		1210.99	63.17			1.12	64.13
	164	0.20			-0.01	0.219		-0.044		-1.45		1211.60	70.63			0.88	71.74
112	165	0.18	0.00	0.04	-0.01	0.196	0.000	-0.035	0.002	-1.11	0.73	1213.32	76.98			0.82	78.18
113	166	0.17	0.00	0.04	-0.01	0.185	0.000	-0.037	0.003	-1.40	0.32	1213.76	84.61			0.41	85.93
	167	0.15			-0.01	0.163		-0.039	0.003	-1.48		1215.22	91.23			0.42	92.69
	168	0.15			-0.01	0.163		-0.039	0.003	-2.16		1215.76	98.76			-0.33	100.35 106.95
	169 170	0.13			-0.01 -0.01	0.140 0.119		-0.030 -0.032	0.006 0.006	-2.25 -2.94		1217.34 1217.71	105.25 112.95			-0.72 -1.51	114.80
	171	0.11			-0.01	0.119		-0.043	0.005	-3.53		1217.71	119.50			-1.97	121.56
	172	0.11			-0.01	0.119		-0.043 -0.044	0.005	-3.33 -4.30		1219.23	127.40			-2.79	121.50
		-0.12				-0.125		-0.005	0.011	-4.66		1220.66	134.21			-3.36	136.49
		-0.12		0.01		-0.125		-0.006	0.001	-5.69		1220.86	142.08			-4.45	144.49
122	175	-0.06	0.00	0.02	0.00	-0.063	0.000	-0.022	0.002	-6.11	-5.31	1222.30	148.72			-5.28	151.34
		-0.06		0.02		-0.063		-0.022	0.002	-7.49		1222.50	156.59			-6.53	159.39
		-0.05		0.02		-0.052		-0.022	-0.008	-8.33		1223.64	163.52			-7.28	166.53
	178 179	0.01		0.00 0.00	0.00	0.011 0.000	0.000	0.000	0.000	-9.78		1223.68 1224.57	171.55 178.73			-8.62 -9.35	174.69 182.07
			0.00	0.00	0.00	0.000	0.000	0.000	0.000	10.50	7.55	1224.37	170.75			7.55	102.07
	= 54 (0.04			0.050		0.010	0.004			- 0.4.40					
	103		0.01	-0.01	0.00		-0.014 0.000	0.013	0.001		-3.14	794.48	-5.38				-5.29
	104 105			0.00 -0.04	0.00 -0.02	0.000 0.076	0.000	0.000 0.051	0.000	-5.16 -4.73	-4.15 -3.19		-15.92 -21.45				-15.82 -21.34
	106			-0.05	0.00	0.129	0.000	0.068	0.009	-4.42	-2.27		-29.19				-29.07
53	107	0.13	0.03	-0.05	0.01	0.140	-0.041	0.069	-0.000	-3.88	-1.47	855.44	-34.05			-1.46	-33.94
54	108	0.15	0.05	-0.05	0.02	0.162	-0.069	0.073	-0.008	-3.65	-0.74	870.61	-41.15			-0.73	-41.04
	109			-0.04	0.02		-0.096		-0.008	-3.32	-0.21		-44.96				-44.86
	110			-0.04	0.03		-0.095		-0.018	-2.85	0.37		-50.87	-51.90	0.133		-50.76
	111 112			-0.03 -0.03	0.03		-0.109 -0.095		-0.018 -0.019	-2.39 -1.77	0.58 1.16		-54.28 -59.46	_50.07	0.104		-54.19 -59.36
	113 114			-0.03 -0.05	0.03		-0.081 -0.014		-0.019 -0.003	-1.20 -1.07	1.65 2.06		-61.88 -66.53		0.081 0.011		-61.82 -66.46
	115			-0.05	0.02	0.237	0.000		-0.003	-0.85	2.29		-68.57		0.012		-68.53
62	116	0.22	0.00	-0.03	0.02	0.238	0.000	0.059	-0.009	-0.17	2.49	966.77	-72.74	-73.05	0.013	2.52	-72.71
63	117	0.22	0.00	-0.02	0.01	0.238	0.000	0.046	-0.002	0.12	2.70	976.27	-74.18	-74.18	0.010	2.70	-74.18
	118			-0.01	0.01	0.238	0.000		-0.005	0.36	2.81		-77.80		0.010		-77.81
	119		0.00	0.00	0.01	0.250	0.000		-0.008	0.23	2.80		-78.84		0.010		-78.89
	120 121	0.23	0.00	0.01 0.02	0.00	0.250 0.251	0.000	-0.001	-0.001	0.28 0.12		1008.30 1016.81			0.012 0.011		-82.04 -82.51
	122	0.23		0.02	0.00	0.251		-0.002 -0.014		0.12		1027.49			0.011		-85.12
	123		0.00	0.03	0.00	0.252		-0.014		-0.23		1035.60			0.010		-85.19
	124	0.21		0.03	0.00	0.229		-0.018		-0.01		1045.77			0.002		-87.30
71	125	0.20	0.00	0.02	0.00	0.217	0.000	-0.007	-0.004	-0.11	2.11	1053.58	-86.91	-87.19	0.002	2.12	-87.07
	126		0.00	0.01	0.00	0.195	0.000		-0.001	-0.11		1063.54			0.006		-88.98
	127	0.16		0.00	0.01	0.172	0.000		-0.009	-0.32		1070.71			0.004		-88.11
	128	0.16		0.01	0.00	0.173		-0.001		-0.79		1080.16			0.001		-89.50
	129	0.15		0.01	0.00	0.162		-0.003		-1.32		1087.19			0.001		-88.49
		-0.12 -0.12		0.02		-0.125 -0.125		-0.018 -0.029		-1.69 -2.59		1096.16 1103.14			0.001	-0.08 -1.06	-89.40 -88.32
		-0.12		0.03		-0.125		-0.029				1112.07			0.001	-1.97	
	133			-0.01	0.00	0.053	0.000	0.013	0.001			1118.85				-3.23	
	134	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1127.86				-4.69	

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 54 ((Xe)															
	135	0.03	0.00	0.01	0.00	0.032	0.000	-0.012	-0.000	-6.74	-5.60	1133.89	-86.51	-86.42	0.005	-5.60	-86.86
	136	0.00		0.00	0.00	0.000	0.000	0.000				1142.31			0.007		-87.22
	137 138	-0.02 0.00			0.00	-0.021	0.000		-0.000						0.007		-83.04
	138			0.00 -0.04	0.00 0.00	0.000	0.000 0.000	0.000 0.051				1151.81 1154.81			0.043 0.021		-80.59 -75.46
	140			-0.05	-0.01	0.097	0.000	0.064				1160.24					-72.76
	141			-0.05	0.00		-0.056	0.068	0.010	-4.74		1163.49			0.091		-67.93
	142			-0.06	0.01		-0.083	0.083	0.004	-4.73		1168.72		-65.47	0.101		-65.01
	143 144			-0.05 -0.05	0.01 0.02		-0.111 -0.096	0.072 0.073	0.005 -0.006	-4.62 -3.84		1171.81 1176.76					-60.02 -56.88
										-3.83							-50.88 -51.79
	145 146			-0.05 -0.07	0.02		-0.110 -0.014	0.075 0.102	-0.004 0.009	-3.83 -3.14		1179.78 1184.44					-31.79 -48.33
	147			-0.07	0.01	0.216	0.000	0.105		-3.47		1187.25					-43.05
94	148			-0.07	0.01	0.216	0.000	0.105	0.011	-3.06		1191.74				0.88	-39.42
95	149			-0.06	0.02		-0.014		-0.002			1194.26					-33.89
	150			-0.05	0.02	0.226	0.000		-0.004			1198.41					-29.97
	151 152			-0.05 -0.04	0.02	0.226 0.226	0.000 0.000		-0.004 -0.018			1200.64 1204.61					-24.10 -19.92
	153			-0.04	0.03	0.249	0.000		-0.018 -0.019			1204.01					-13.78
	154			-0.02	0.03	0.249	0.000		-0.022			1210.19	-9.45			1.47	-9.30
101	155	0.24	0.00	-0.01	0.04	0.261	0.000	0.041	-0.034	-2.09	1.06	1212.04	-3.23			1.34	-2.92
	156	0.24		0.00	0.03	0.261	0.000		-0.027			1215.34	1.54			1.48	1.81
	157	0.24		0.01	0.03	0.262	0.000		-0.030			1216.90	8.06			1.26	8.39
104	158	0.24 0.23		0.02	0.03	0.263 0.251	0.000 0.000		-0.033 -0.023			1220.01 1221.13	13.02 19.96			1.44	13.46 20.35
	160	0.23		0.02	0.02	0.252			-0.026			1223.97	25.19			1.42	25.71
107		0.23		0.03	0.02	0.252			-0.020 -0.019			1224.85	32.38			1.42	32.93
	162	0.21		0.03	0.01	0.229			-0.016			1227.42	37.89			1.38	38.49
109		0.21		0.04	0.00	0.230				-1.26		1228.14	45.24			1.20	45.93
110	164	0.21	0.00	0.05	0.00	0.230	0.000	-0.041	-0.011	-1.24	1.17	1230.52	50.93			1.30	51.78
111		0.20		0.05	0.00	0.219			-0.010			1231.09	58.43			1.02	59.37
112 113		0.18 0.18		0.04	0.00 -0.01	0.196 0.197		-0.034 -0.047	-0.007	-0.93 -1.44		1233.18 1233.66	64.42 72.00			1.07 0.69	65.43 73.18
114			0.00			0.162			-0.005			1235.66	78.08			0.53	79.28
115	169	0.15			-0.01	0.163		-0.039		-1.73		1235.85	85.96			0.22	87.34
116	170	0.15	0.00	0.04	-0.01	0.163	0.000	-0.039	0.003	-1.98	-0.15	1237.80	92.07			-0.05	93.59
117		0.13			-0.01	0.141		-0.042				1238.13	99.82			-0.76	101.48
118		0.11			-0.02	0.119		-0.044				1240.26	105.76			-1.36	107.64
119 120		0.11 -0.12			-0.02	0.119 -0.125		-0.044 -0.005				1240.41 1242.02	113.68 120.15				115.70 122.16
		-0.12		0.01		-0.125		-0.006				1242.17	128.06			-3.67	130.20
		-0.12 -0.06		0.01		-0.123 -0.063		-0.000 -0.022		-5.24			134.29			-3.67 -4.46	136.62
		-0.06		0.02	0.00	-0.063		-0.022				1244.23	142.14			-5.71	144.64
		-0.06		0.02		-0.063		-0.022				1245.78	148.67			-6.43	151.37
	179	0.00		0.00	0.00	0.000	0.000	0.000				1245.85	156.66			-7.78	159.49
	180	0.00		0.00	0.00	0.000	0.000	0.000				1247.15	163.44			-8.48	166.45
	181	-0.01 0.00		0.00	0.00	-0.011 0.000	0.000 0.000	0.000				1244.94 1244.31	173.72 182.42			-7.68	176.93 185.83
			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.07	-0.04	1244.51	102.42			-0.04	105.05
	= 55 (0.00	0.01	0.00	0.006	0.000	0.050	0.005	2.60	0.17	001.01	0.00			2 17	0.00
	106 107			-0.04 -0.05	0.00	0.096	0.000 -0.056	0.052	-0.005	-3.68 -3.79			-9.38 -17.51				-9.23 -17.36
	107			-0.05	0.01		-0.036 -0.096		-0.006				-23.19				-23.06
	109			-0.05	0.03		-0.109		-0.014				-30.68				-30.54
55	110	0.16	0.09	-0.04	0.03	0.174	-0.123		-0.015		-0.39	880.86	-36.04			-0.40	-36.20
	111			-0.04	0.03		-0.123		-0.014		0.14		-42.40				-42.27
	112			-0.03	0.03		-0.122		-0.016		0.76		-46.09	£1.70	0.104		-45.99
58	113	0.19	0.09	-0.03	0.03	0.207	-0.122	0.056	-0.016	-2.32	1.23	920.53	-51.49	-51.70	0.104	1.24	-51.39

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 55 ((Cs)															
59	114	0.21	0.07	-0.04	0.03	0.228	-0.095	0.072	-0.014	-1.83	1.72	931.72	-54.62			1.71	-54.55
	115			-0.06	0.01	0.260	0.000	0.101		-1.82	2.06		-59.45				-59.37
	116 117			-0.06 -0.04	0.01	0.260 0.260	0.000	0.101 0.076	0.013	-1.64 -0.80	2.25 2.46		-62.20 -66.48	_66.44	0.062		-62.15 -66.44
	117			-0.04 -0.03	0.01	0.260			-0.003	-0.80 -0.47	2.40		-68.60		0.002		-68.60
	119			-0.01	0.01	0.261	0.000		-0.004	-0.03	2.86		-72.23		0.014		-72.24
	120		0.00	0.00	0.01	0.250	0.000		-0.008	0.19	2.84		-73.95		0.010		-73.99
	121		0.00	0.01	0.01	0.250	0.000		-0.011	0.19		1010.88			0.014		-77.33
	122 123		0.00 0.00	0.02	0.01	0.262 0.252	0.000		-0.013 -0.016	-0.15		1020.09 1030.80			0.032 0.012		-78.50 -81.14
			0.00														
	124 125		0.00	0.03	0.00	0.252 0.240			-0.006 -0.006	-0.29 -0.16		1039.59 1049.78			0.008 0.008		-81.90 -84.02
	126	0.22		0.04	0.00	0.241		-0.028		-0.51		1058.11			0.012		-84.31
	127		0.00	0.02	0.01	0.206			-0.013			1068.03			0.006		-86.18
	128		0.00	0.02	0.01	0.206	0.000	-0.008	-0.013	-0.56		1076.00			0.005		-86.11
	129		0.00	0.02	0.01	0.184			-0.013			1085.33			0.005		-87.38
	130 131	0.16	0.00	0.01	0.01	0.173 0.151			-0.011 -0.011			1092.89 1101.80			0.008		-86.89 -87.75
	132		0.00	0.01	0.00	0.140			-0.001			1109.10			0.002		-87.01
78	133	-0.12	0.00	0.03	0.01	-0.125	0.000	-0.029	-0.005	-2.76	-1.27	1118.20	-87.74	-88.07	0.000	-1.25	-88.04
	134	-0.12		0.03	0.01	-0.125	0.000	-0.029	-0.005			1125.33			0.000		-87.12
	135	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1134.39			0.001		-88.14
	136 137		0.00 0.00	0.00	0.00	0.053 0.000	0.000	0.001	0.000 0.000			1141.01 1149.51			0.002		-86.70 -87.15
	138	-0.02		0.00		-0.021	0.000	0.000				1153.99			0.009		-83.56
	139	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-4.94	-4.03	1159.69	-80.81	-80.70	0.003		-81.20
	140			-0.04	-0.01		-0.042	0.052	0.016			1163.39			0.008		-76.76
	141			-0.05	0.00		-0.056	0.067	0.009			1168.96			0.011		-74.23
	142 143			-0.05 -0.06	0.01		-0.097 -0.112	0.070 0.084	0.003			1173.06 1178.48				-1.54 -0.92	-70.23
				-0.00			-0.112 -0.124										
	144 145			-0.05	0.02		-0.124 -0.110					1182.24 1187.28			0.026 0.011		-63.20 -60.16
	146			-0.05	0.02		-0.124					1190.94			0.071		-55.73
	147			-0.07	0.01		-0.055	0.104				1195.62			0.053		-52.28
	148			-0.07	0.01	0.216	0.000	0.105		-3.40		1199.02		-47.30	0.576		-47.62
	149 150			-0.07	0.01	0.227	0.000	0.107 0.097		-3.22 -3.10		1203.56					-44.04 -39.11
	150			-0.06 -0.05	0.02	0.237 0.226	-0.027 0.000		-0.004			1206.69 1210.88					-35.11 -35.24
	152			-0.05	0.03	0.248	0.000		-0.013			1213.78					-30.00
98	153	0.23	0.00	-0.03	0.03	0.249	0.000	0.062	-0.019	-1.97	1.13	1217.71	-25.83			1.31	-25.87
	154			-0.02	0.03	0.260	0.000		-0.021			1220.21					-20.28
100				-0.01	0.03	0.261	0.000		-0.024			1223.91					-15.85
101 102			0.00	-0.01 0.00	0.04 0.04	0.261 0.262	0.000		-0.034 -0.037			1226.33 1229.80	-10.24 -5.63				-10.06 -5.37
103			0.00	0.01	0.03	0.262	0.000		-0.030			1231.72	0.52			1.18	0.72
104	159	0.24	0.00	0.02	0.03	0.263	0.000	0.004	-0.033	-1.85	1.11	1234.90	5.41			1.32	5.71
105		0.24		0.03	0.02	0.263	0.000		-0.026			1236.51	11.87			1.19	12.15
106			0.00	0.03	0.02	0.252			-0.026			1239.37	17.08			1.35	17.44
107 108			0.00 0.00	0.04 0.04	0.01	0.253 0.230			-0.019 -0.018			1240.75 1243.38	23.77 29.22			1.21 1.33	24.17 29.71
108				0.04		0.230			-0.018				36.10			1.33	
1109			0.00 0.00	0.04	0.01	0.230			-0.018 -0.011			1244.57 1246.94	41.80			1.16	36.66 42.47
111			0.00	0.05	0.00	0.219			-0.011			1247.97	48.84			1.01	49.60
112	167	0.19	0.00	0.05	0.00	0.208			-0.010		0.93	1250.14	54.74			1.06	55.61
113	168	0.18	0.00	0.05	-0.01	0.197	0.000	-0.047	0.000	-1.41	0.65	1250.95	62.00			0.77	62.98
114			0.00		-0.01	0.197		-0.047		-1.45		1253.01	68.02			0.68	69.11
115	170	0.15	0.00	0.05	-0.01	0.163	0.000	-0.051	0.002	-1.75	0.23	1253.61	75.49			0.38	76.70

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z :	= 55 ((Cs)															
116	171	0.15	0.00	0.05	-0.01	0.163	0.000	-0.051	0.002	-1.99	-0.04	1255.60	81.57			0.12	82.92
117		0.13			-0.02	0.140		-0.042				1256.30	88.94			-0.51	90.42
118 119		0.11	0.00		-0.02 -0.02	0.119 0.119		-0.044 -0.044		-2.64 -3.43		1258.32 1258.92	94.98 102.46			-1.04 -1.80	96.61 104.22
120		0.11			-0.02 -0.01	0.119		-0.044 -0.032				1260.39	102.40			-2.11	1104.22
		-0.12		0.01		-0.125		-0.006	0.001			1261.05	116.48			-3.22	118.35
122	177	-0.07	0.00	0.02		-0.073	0.000	-0.021	-0.008	-4.80		1262.88	122.71			-3.97	124.79
		-0.07		0.02		-0.073		-0.021	0.002			1263.52	130.15			-5.20	132.37
		-0.06 -0.01		0.02		-0.063 -0.011	0.000	-0.022 0.000	-0.008 0.000	-6.96 -8.34		1265.10 1265.60	136.64 144.21			-5.93 -7.27	139.05 146.74
126		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-9.08		1266.86	151.02			-7.92	153.72
		-0.00		0.00		-0.011	0.000	0.000	0.000	-8.25		1265.13	160.82			-7.92 -7.17	163.70
		-0.01		0.00		-0.011	0.000	0.000	0.000	-7.14		1264.53	169.50			-6.14	172.57
129		0.02		0.00	0.00	0.021	0.000	0.000	0.000			1262.42	179.68			-5.20	182.95
130	185	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-4.94	-4.11	1261.56	188.61			-4.11	192.08
	= 56 (
	108			-0.05	0.01		-0.069	0.070		-3.12		835.66	-7.76			-0.71	-7.55
	109 110			-0.05 -0.04	0.02		-0.110 -0.123		-0.005 -0.014	-3.47	-0.17 -0.28		-13.73 -22.49				-13.53 -22.29
	111			-0.04	0.03		-0.136			-3.43	0.13		-27.80				-27.62
56	112	0.18	0.10	-0.03	0.04	0.197	-0.135	0.056	-0.025	-3.03	0.59	895.36	-35.19			0.62	-35.00
57	113	0.19	0.10	-0.03	0.04	0.208	-0.135	0.057	-0.024	-2.63	1.09	907.37	-39.13			1.09	-38.97
	114			-0.03	0.04		-0.121	0.059	-0.025		1.52		-45.26	-45.95	0.139		-45.10
	115 116			-0.07 -0.06	0.01 0.02	0.261 0.282	0.000	0.114 0.106		-2.25 -2.20	1.88 2.01		-48.62 -54.34				-48.49 -54.21
	117			-0.05	0.02	0.282	0.000	0.094		-1.75	2.17		-57.24				-57.15
62	118	0.27	0.00	-0.04	0.02	0.293	0.000	0.084	-0.002	-1.45	2.32	970.86	-62.25			2.34	-62.17
	119			-0.03	0.01	0.283	0.000	0.068	0.004	-0.89	2.57		-64.41	-64.59	0.200		-64.37
	120 121			-0.01	0.02	0.283	0.000		-0.013	-0.39	2.85		-68.64		0.300		-68.61
	121	0.26	0.00	0.00	0.02	0.284 0.273	0.000		-0.016 -0.010		2.87 2.78	1003.24 1015.29			0.142 0.028		-70.43 -74.42
	123	0.25		0.02	0.01	0.274	0.000		-0.013			1024.64			0.012		-75.73
	124	0.24		0.03	0.01	0.263			-0.016			1035.97			0.012		-79.00
	125		0.00	0.04	0.01	0.264			-0.019			1044.87			0.011		-79.86
	126 127	0.24 0.23	0.00	0.05	0.00	0.264 0.253			-0.012 -0.019			1055.64			0.012 0.011		-82.56
		0.23		0.04	0.01							1064.02 1074.38					-82.90
	128 129	0.21		0.03	0.01	0.229 0.218			-0.016 -0.016			1074.38			0.010 0.011		-85.21 -85.20
	130	0.18		0.02	0.01	0.195			-0.013			1092.45			0.003		-87.19
	131	0.17		0.02	0.01	0.184			-0.013			1099.91			0.003		-86.61
	132	0.15		0.02	0.01	0.162			-0.013			1109.31			0.001		-87.96
	133	0.14 -0.12		0.02	0.00	0.151 -0.125			-0.003			1116.60 1126.09			0.001		-87.21 -88.63
		-0.12		0.03		-0.125 -0.125						1133.23			0.000		-86.03 -87.72
	136	0.02		0.00	0.00	0.021	0.000	0.000				1142.89			0.000	-2.75	
81	137	0.05	0.00	0.00	0.00	0.053	0.000	0.001	0.000	-4.83	-3.74	1149.66	-87.70	-87.72	0.000	-3.74	-88.07
	138	0.00		0.00	0.00	0.000	0.000	0.000				1158.72			0.000		-89.07
	139 140	-0.03	0.00	0.00 0.00	0.00 0.00	-0.032 0.000	0.000	0.000 0.000				1163.30 1169.61				-4.24 -3.21	
	140			-0.00	0.00		-0.069	0.000				1173.41			0.008 0.008		-83.83 -79.50
	142			-0.05	0.01		-0.083	0.069				1179.62			0.006	-1.20	
87	143	0.14	0.08	-0.05	0.01	0.152	-0.111	0.072	0.005	-4.76	-1.07	1183.92	-73.53	-73.94	0.013	-0.92	-73.80
	144			-0.05	0.02		-0.124					1189.97			0.013	-0.40	
	145			-0.05	0.02		-0.138					1193.87			0.071		-67.55
	146 147			-0.05 -0.05	0.02		-0.124 -0.123		-0.003 -0.012			1199.80 1203.33		-05.00	0.072		-65.40 -60.83
	148			-0.08	0.01	0.228	0.000	0.120		-3.92		1208.73		-58.01	0.084		-58.09
	- 10	0.21	5.50	0.00	0.01	5.220	3.000	5.120	5.510	5.72	0.51	1200.70	21.77	20.01	3.001	0.05	20.07

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z =	= 56 ((Ba)															
93			0.00	-0.08	0.01	0.239	0.000	0.122	0.017	-4.27	0.39	1212.35	-53.53			0.69	-53.63
94				-0.07	0.02	0.237	0.000	0.110		-3.38		1217.43					-50.65
95 96				-0.06	0.02	0.249 0.249	0.000 0.000	0.099	0.001 -0.002	-3.28		1220.59 1225.37					-45.78 -42.49
96 97				-0.05 -0.05	0.02	0.249	0.000		-0.002 -0.012			1228.33					-42.49 -37.32
	154			-0.04	0.03	0.259	0.000		-0.015			1232.84					-33.74
99				-0.02	0.03	0.271	0.000		-0.021			1235.43					-28.27
100				-0.02	0.04	0.260	0.000		-0.031			1239.70					-24.33
101 102		0.25		-0.01 0.00	0.04	0.272 0.273	0.000 0.000		-0.034 -0.037			1242.10 1246.05					-18.62 -14.43
						0.273			-0.037 -0.040			1248.17					-8.42
103 104		0.25 0.25		0.01 0.02	0.04 0.03	0.273	0.000 0.000		-0.040 -0.033			1248.17	-8.64 -4.08			1.05 1.24	-8.42 -3.88
105		0.24		0.02	0.03	0.263	0.000		-0.033			1253.45	2.22			1.07	2.47
106		0.24		0.03	0.02	0.263			-0.026			1256.66	7.08			1.30	7.34
107		0.23		0.04	0.02	0.253			-0.029			1258.12	13.69			1.21	14.05
108		0.23 0.21		0.04	0.01	0.253			-0.019 -0.018			1261.06 1262.34	18.82			1.42	19.18 26.04
109 110		0.21		0.04 0.05	0.01	0.230 0.230			-0.018 -0.011			1262.34	25.61 30.91			1.19 1.39	26.04 31.44
111		0.21		0.05	0.00	0.230			-0.011			1266.16	37.94			1.14	38.54
112	168	0.20	0.00	0.05	0.00	0.219			-0.010		1.16	1268.70	43.47			1.30	44.18
113	169	0.20	0.00	0.06	-0.01	0.220	0.000	-0.056	-0.003	-1.65	0.81	1269.61	50.63			0.99	51.48
114		0.18			-0.01	0.197		-0.047		-1.22		1272.04	56.28			0.96	57.19
115		0.17			-0.01	0.185		-0.049		-1.55		1272.53 1275.03	63.85			0.79	64.87
116 117		0.15 0.15			-0.01 -0.02	0.163 0.163		-0.051 -0.052	0.002	-1.63 -2.29		1275.03	69.43 76.75			0.49 -0.12	70.58 78.06
118		0.13			-0.02	0.141		-0.054		-2.40		1278.05	82.54			-0.43	84.00
119		0.13			-0.01	0.119		-0.043				1278.65	90.02			-1.27	91.50
120		0.11		0.03	-0.01	0.119	0.000	-0.032	0.006			1280.56	96.18			-1.52	97.75
121		-0.12		0.01		-0.125		-0.006	0.001			1281.21	103.60			-2.59	105.24
122		-0.07		0.02		-0.073		-0.021	0.002			1283.26	109.63			-3.12	111.43
123 124		-0.06 -0.06		0.02		-0.063 -0.063		-0.022 -0.022	0.002 -0.008	-5.41 -6.24		1284.11 1286.11	116.84 122.92			-4.53 -5.24	118.80 125.05
125		0.00		0.00	0.00	0.000	0.000	0.000				1286.54	130.56				132.80
		-0.01		0.00		-0.011	0.000	0.000				1288.22					139.35
127	183	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-7.45	-6.42	1286.57	146.67			-6.42	149.25
128		0.00		0.00	0.00	0.000	0.000	0.000				1286.33	154.98				157.74
129		0.02 -0.01		0.00	0.00	0.021 -0.011	0.000 0.000	0.000 0.000				1284.26 1283.82	165.12 173.64				168.07 176.77
131				-0.05	0.00		-0.083	0.066				1282.15					187.04
132	188	0.11	0.08	-0.05	0.00	0.121	-0.112	0.068	0.013	-4.93	-2.40	1282.02	191.57				195.53
133	189	0.11	0.09	-0.06	0.01	0.121	-0.125	0.082	0.006	-5.30	-2.43	1280.53	201.14			-1.90	205.41
Z =	= 57 ((La)															
	110		0.06	-0.05	0.02	0.184	-0.082	0.076	-0.005	-2.69	-0.03	845.52	-2.27			-0.06	-2.04
54				-0.04	0.03		-0.123		-0.014		0.24		-10.78				-10.55
	112			-0.04	0.04		-0.135		-0.023		0.55		-16.89				-16.68
56				-0.03	0.04		-0.135		-0.024		0.82		-24.59				-24.39
	114			-0.05	0.04		-0.108		-0.020		1.31		-29.48				-29.57
58 59	115			-0.06 -0.07	0.02	0.261	-0.068 0.000	0.102 0.117		-2.50 -2.76	1.53 1.60		-36.21 -40.54				-36.03 -40.40
60				-0.06	0.02	0.282	0.000	0.117		-2.65	1.63		-46.47				-46.34
	118			-0.05	0.02	0.293	0.000	0.096		-2.41	1.76	957.89	-50.07				-49.98
62				-0.05	0.02	0.293	0.000	0.096		-2.18	1.96		-55.15			1.96	-55.05
63				-0.04	0.02	0.293	0.000		-0.002		2.17		-58.00				-57.95
64 65	121 122	0.27 0.27		-0.02 0.00	0.02	0.294 0.295	0.000 0.000		-0.009 -0.016		2.46	994.37 1004.87	-62.33				-62.29 -64.76
66		0.27		0.00	0.02	0.293	0.000		-0.010 -0.010			1004.87					-64.76 -68.78
	124	0.26		0.02	0.01	0.285	0.000		-0.013				-70.58	-70.26	0.057		-70.63

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 57 ((La)															
	125	` ′	0.00	0.03	0.01	0.286	0.000	-0.006	-0.016	-0.69	2.53	1038.25	-73.93	-73.76	0.026	2.54	-73.98
	126		0.00	0.04	0.00	0.286			-0.010			1047.70			0.091		-75.40
	127 128	0.25	0.00	0.04	0.00 0.00	0.275 0.264			-0.009 -0.009			1058.52 1067.44			0.026 0.054		-78.15 -79.04
	129	0.24		0.04	0.00	0.241			-0.009			1077.78			0.034		-79.04 -81.31
73	130	0.21	0.00	0.02	0.01	0.229	0.000	-0.004	-0.013	-0.25	2.09	1086.31	-81.64	-81.63	0.026		-81.82
	131	0.19		0.02	0.01	0.206			-0.013			1096.27			0.028		-83.72
	132 133	0.17 0.16	0.00	0.03	0.00 0.00	0.185 0.174			-0.005 -0.005			1104.29 1113.99			0.039 0.028		-83.70 -85.35
	134	0.10		0.03	0.00	0.174			-0.003			1121.69			0.020		-85.01
78	135	0.12	0.00	0.02	0.00	0.129	0.000	-0.018	-0.002	-1.30	0.15	1131.16	-86.12	-86.65	0.010	0.16	-86.42
	136		0.00	0.01	0.00	0.107			-0.001			1138.78			0.053		-86.00
	137 138	0.05	0.00	0.00	0.00 0.00	0.053 0.053	0.000	0.001	-0.000 -0.001	-2.84		1148.32			0.013 0.004	-1.88 -2.99	-87.50
	139		0.00	0.00	0.00	0.000	0.000	0.000				1164.88					-87.95
83	140	0.05	0.00	-0.01	0.00	0.053	0.000	0.013	0.001			1169.99			0.002	-3.40	-85.00
	141		0.00	0.00	0.00	0.053	0.000	0.001				1176.37					-83.32
	142 143			-0.03 -0.04	0.00 0.00		-0.083 -0.111	0.042 0.057				1180.90 1187.31					-79.74 -78.03
	144			-0.04 -0.05	0.00		-0.111 -0.125	0.037				1192.25			0.013		-78.03 -74.87
88	145	0.16	0.09	-0.05	0.02	0.174	-0.124	0.075	-0.003	-4.42	-0.19	1198.45	-72.70	-72.99	0.090	-0.02	-72.97
	146			-0.04	0.02		-0.137		-0.004			1203.21			0.071		-69.68
	147 148			-0.05 -0.08	0.02		-0.124 -0.028	0.077 0.120	-0.002	-3.84 -4.27		1208.92 1213.16			0.048 0.059		-67.29 -63.40
	149			-0.08	0.01	0.228	0.000	0.120		-4.27 -4.30		1213.10		-03.13	0.039		-63.40 -61.06
93	150	0.22	0.00	-0.08	0.01	0.239	0.000	0.122	0.017	-4.46		1223.07				0.57	-57.14
	151	0.23	0.00	-0.07	0.02	0.249	0.000	0.112	0.004	-3.83	0.62	1228.23	-54.05				-54.24
	152			-0.06	0.02	0.260	0.000	0.101		-3.75		1231.95					-49.93
	153 154			-0.06 -0.05	0.03	0.259 0.259	0.000 0.000		-0.008 -0.012	-3.45 -3.31		1236.86 1240.34					-46.70 -42.13
	155			-0.04	0.03	0.271	0.000		-0.014			1244.90					-38.60
	156			-0.03	0.03	0.271	0.000	0.067	-0.017	-2.96		1248.00				0.88	-33.64
	157			-0.02	0.04	0.271	0.000		-0.031			1252.36					-29.80 -24.58
	158 159		0.00	-0.01 0.00	0.04 0.04	0.272 0.273	0.000 0.000		-0.034 -0.037			1255.23 1259.21					-24.38 -20.42
103	160	0.25	0.00	0.01	0.04	0.273	0.000	0.020	-0.040	-2.76	0.60	1261.81	-14.99			0.87	-14.89
	161	0.25	0.00	0.01	0.03	0.273	0.000		-0.030		0.93	1265.33					-10.39
	162	0.25 0.24		0.02	0.03	0.274	0.000		-0.033 -0.026			1267.56	-4.60			0.98	-4.49
	163 164	0.24		0.03	0.02	0.263 0.264			-0.020 -0.019			1270.80 1272.68	0.23 6.42			1.23 1.12	0.35 6.56
108	165	0.23		0.04	0.01	0.253			-0.019			1275.65	11.53			1.44	11.74
109	166	0.23	0.00	0.05	0.00	0.253	0.000	-0.038	-0.012	-1.60	1.22	1277.31	17.94			1.32	18.22
110 111	167	0.21		0.05	0.00	0.230			-0.011			1280.16	23.15			1.47	23.52
111		0.21 0.20	0.00		-0.01 -0.01	0.231 0.220			-0.004 -0.003			1281.64 1284.27	29.75 35.19			1.31 1.43	30.23 35.78
	170	0.20			-0.02	0.220		-0.069		-1.80		1285.70	41.83			1.11	42.60
114	171	0.18	0.00		-0.01	0.197	0.000	-0.059	-0.002	-1.28	0.98	1288.04	47.56			1.17	48.35
115			0.00		-0.02	0.186		-0.062		-1.65		1289.10	54.57			0.93	55.50
	173 174		0.00		-0.01 -0.02	0.163 0.163		-0.051 -0.052		-1.46 -2.14		1291.49 1292.72	60.25 67.10			0.67 0.04	61.20 68.20
118			0.00		-0.02	0.152		-0.053		-2.28			72.92			-0.22	74.15
119	176	0.11	0.00	0.04	-0.01	0.119	0.000	-0.043	0.005	-2.55	-1.08	1295.94	80.01			-0.97	81.27
	177	0.11			-0.02	0.119		-0.044				1297.99	86.04			-1.21	87.49
	178 179	-0.10 -0.07	0.00	0.03	-0.01 0.00	0.108 -0.073		-0.032 -0.021		-3.46 -3.69		1298.97 1300.93	93.14 99.24			-2.19 -2.69	94.61 100.81
		-0.06		0.02		-0.063		-0.022				1302.24	106.00				107.71
		-0.06		0.02		-0.063			-0.008				112.06				113.94

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E_{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	$M_{\rm exp}$ (MeV)	$\sigma_{\rm exp}$ (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
	= 57 (l	[.a)															
	182	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-7.09	-6.02	1305.08	119.31			-6.02	121.28
	183	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-7.76	-6.62	1306.76	125.70				127.84
		-0.02		0.00		-0.021	0.000	0.000	0.000	-6.98		1305.57	134.96			-5.96	137.26
	185	0.01		0.00	0.00	0.011	0.000	0.000				1305.34	143.26			-4.86	145.73
	186	0.02		0.00	0.00	0.021	0.000	0.000	0.000			1303.71	152.96			-3.96	155.60
	187 188	0.01		0.00 -0.04	0.00 0.00	0.011	0.000 -0.097	0.000 0.054	0.000			1303.25 1302.06	161.50 170.75			-2.83 -2.30	164.32 174.02
	189			-0.04 -0.05	0.00		-0.097 -0.112	0.054	0.009			1302.00	170.73			-2.50 -1.63	182.48
	190			-0.05	0.00		-0.126	0.069	0.014	-4.79		1300.85	188.10			-1.56	191.93
134	191	0.13	0.10	-0.05	0.01	0.143	-0.139	0.072	0.007	-4.69	-1.49	1300.65	196.38			-1.04	200.43
135	192	0.14	0.10	-0.06	0.02	0.153	-0.138	0.085	-0.001	-5.01	-1.61	1299.48	205.61			-1.05	209.98
\boldsymbol{Z}	= 58 (Ce)															
	113			-0.04	0.04		-0.108		-0.024		0.98		-7.33				-7.06
	114			-0.03	0.04		-0.107		-0.026		1.21		-15.76				-15.49
	115 116			-0.05 -0.06	0.03 0.02	0.249	-0.082 0.000	0.088	-0.010	-2.16 -2.54	1.47 1.50		-21.27 -29.11				-21.04
	117			-0.06	0.02	0.282	0.000	0.106		-2.34 -2.77	1.44		-29.11 -33.69				-28.89 -33.51
	118			-0.05	0.03	0.304	0.000		-0.007		1.34		-40.43				-40.24
	119			-0.05	0.03	0.304	0.000		-0.007		1.45		-44.16				-44.01
62	120	0.28	0.00	-0.04	0.03	0.304	0.000	0.087	-0.011	-2.48	1.62	973.10	-49.92			1.63	-49.78
	121			-0.03	0.03	0.305	0.000		-0.015		1.79		-52.94				-52.84
	122			-0.02	0.02	0.305	0.000		-0.008		2.00		-58.00				-57.91
	123			-0.01	0.02	0.306	0.000		-0.012			1007.87					-60.43
	124 125	0.27 0.27		0.00 0.01	0.01 0.00	0.295 0.296	0.000	0.033		-1.04 -1.03		1020.44 1030.43					-64.93 -66.90
	126	0.27		0.03	0.00	0.297	0.000		-0.007			1042.42		-70.82	0.028		-70.83
	127	0.27		0.03	0.00	0.297	0.000		-0.007			1051.90			0.058		-72.28
70	128	0.26	0.00	0.04	0.00	0.286	0.000	-0.019	-0.010	-0.81	2.46	1063.26	-75.51	-75.53	0.028	2.48	-75.57
	129	0.25		0.04	0.00	0.275			-0.009			1072.21			0.028		-76.49
	130	0.23		0.03	0.01	0.252			-0.016			1083.07			0.028		-79.29
	131 132	0.21 0.19		0.03	0.01 0.01	0.229 0.207		-0.016 -0.020	-0.016	-0.10 0.09		1091.65 1102.22			0.034 0.021		-79.83 -82.35
	133	0.19			0.00	0.196			-0.005			1110.30					-82.39
	134		0.00	0.03	0.00	0.190			-0.005			1110.30			0.010		-82.39 -84.50
	135	0.15		0.03	0.00	0.162			-0.005			1128.33			0.011		-84.33
78	136	0.12	0.00	0.02	0.00	0.129			-0.002		0.68	1138.13	-85.81	-86.47	0.013	0.69	-86.10
79	137	0.12	0.00	0.02	0.00	0.129	0.000	-0.018	-0.002	-1.58	-0.13	1145.84	-85.45	-85.88	0.013	-0.12	-85.76
	138	0.06		0.01	0.00	0.064						1155.87				-1.25	
	139	0.05			-0.01	0.053		-0.011				1163.46				-2.39	
	140 141	0.00 -0.03		0.00	0.00 0.00	0.000 -0.032	0.000 0.000	0.000 0.000				1173.12 1178.35				-3.62 -2.84	
	142	0.01		0.00	0.00	0.011	0.000	0.000				1185.30				-1.79	
85	143	0.12	0.06	-0.03	0.00	0.130	-0.083	0.044	0.008	-3.22	-0.79	1189.88	-81.06	-81.61	0.003	-0.73	-81.43
	144			-0.04	0.01		-0.097	0.058				1196.88			0.003		-80.33
	145			-0.04	0.01		-0.110	0.061				1201.90			0.041		-77.27
	146			-0.05	0.02		-0.124		-0.003			1208.96			0.066		-76.21
	147			-0.05	0.02		-0.110		-0.003			1213.47			0.031		-72.68
	148 149			-0.05	0.02	0.206 0.228	-0.096		-0.002			1219.82			0.029		-70.94 -67.51
	150			-0.08 -0.08	0.01 0.01	0.228	0.000 0.000	0.120 0.122		-4.11 -4.33		1224.53 1230.88			0.097 0.048		-67.31 -65.75
	151			-0.07	0.02	0.249	0.000	0.112		-4.25		1235.12			0.103		-61.97
	152			-0.07	0.03	0.259	0.000		-0.005			1240.95					-59.68
95	153	0.24	0.00	-0.06	0.03	0.259	0.000	0.102	-0.008	-4.00	0.34	1244.80	-55.27			0.57	-55.50
	154			-0.05	0.03	0.270	0.000		-0.010			1250.27					-52.89
	155			-0.05	0.03	0.270	0.000		-0.010			1253.85					-48.39
	156 157			-0.04 -0.03	0.03 0.04	0.271 0.282	0.000 0.000		-0.014 -0.026			1258.94 1262.17					-45.40 -40.49
- 	13/	0.20	0.00	-0.03	0.04	0.282	0.000	0.071	-0.020	-5.04	0.57	1202.1/	-40.33			0.00	-40.49

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 58 ((Ce)															
	158		0.00	-0.02	0.04	0.282	0.000	0.058	-0.030	-3.24	0.56	1266.94	-37.05			0.81	-37.15
101				-0.01	0.04	0.283	0.000		-0.033			1269.86					-31.99
102 103		0.26		0.00	0.04	0.284	0.000		-0.036 -0.039			1274.30 1276.94					-28.28 -22.82
	162	0.26 0.25		0.01 0.01	0.04 0.03	0.285 0.273	0.000		-0.039 -0.030			12/6.94					-22.82 -18.75
	163	0.25		0.02	0.03	0.274	0.000		-0.033			1283.16					-12.89
106		0.25		0.03	0.03	0.275	0.000		-0.026			1286.86	-8.54			1.14	-8.51
107		0.24		0.04	0.01	0.264			-0.019			1288.78	-2.38			1.05	-2.34
108		0.24		0.04	0.01	0.264			-0.019			1292.26	2.20			1.33	2.32
109		0.23		0.05	0.01	0.254			-0.021			1293.93	8.60			1.28	8.81
110 111		0.21		0.05	0.00	0.230 0.231			-0.011 -0.013			1297.12 1298.73	13.48 19.94			1.53 1.29	13.74 20.31
112		0.21			-0.00	0.231			-0.013 -0.004			1301.71	25.04			1.52	25.49
113		0.20			-0.02	0.220		-0.069		-1.71		1303.14	31.68			1.24	32.30
114	172	0.19	0.00	0.07	-0.02	0.209	0.000	-0.071	0.005	-1.48	1.10	1305.96	36.93			1.38	37.66
115		0.18			-0.02	0.197		-0.060	0.008	-1.57		1307.18	43.78			0.92	44.54
116		0.15			-0.02	0.163		-0.064				1309.81	49.22			0.99	50.10
117 118		0.15 0.14			-0.02 -0.02	0.163 0.152		-0.064 -0.053		-2.07 -1.95		1311.06 1313.66	56.05 61.51			0.33	57.03 62.56
119		0.13			-0.02	0.132		-0.054				1314.51	68.74			-0.38	69.90
120	178	0.11	0.00	0.04	-0.02	0.119	0.000	-0.044	0.015	-2.33	-0.92	1317.03	74.29			-0.74	75.54
121		0.10		0.03	-0.01	0.108		-0.032		-2.90			81.47			-1.61	82.73
		-0.07		0.02		-0.073		-0.021		-3.11		1320.36	87.10			-2.14	88.44
		-0.06		0.02		-0.063		-0.022	0.002	-4.41		1321.69	93.84			-3.56	95.32
		-0.06		0.02		-0.063		-0.022	-0.008	-5.24			99.46			-4.25	101.10
125 126		0.00 0.00		0.00	0.00	0.000	0.000	0.000 0.000	0.000			1325.01 1327.13	106.67 112.61			-5.47 -6.09	108.40 114.49
	185	-0.00		0.00	0.00		0.000	0.000	0.000			1327.13	121.94			-5.34	123.97
128		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.27		1326.14	129.75			-4.30	131.94
129	187	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-4.25	-3.36	1324.49	139.47			-3.36	141.83
130		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-3.02		1324.47	147.57			-2.24	150.09
131			0.08		0.00		-0.111	0.055	0.011	-4.43		1323.37	156.74			-1.74 -1.11	159.74
132 133				-0.04 -0.05	0.00		-0.111 -0.125	0.056 0.070				1323.63 1322.56	164.54 173.68				167.74 177.16
134				-0.05	0.01		-0.139	0.072				1322.83					185.21
135	193	0.14	0.10	-0.05	0.02	0.153	-0.138	0.073	-0.003	-4.27	-1.02	1321.59	190.80			-0.55	194.74
136	194	0.15	0.10	-0.05	0.02	0.164	-0.138	0.074	-0.002				198.68			-0.22	202.84
137	195	0.18	0.00	-0.09	0.00	0.196	0.000	0.127	0.025	-4.46	-1.15	1320.79	207.75			-0.36	212.42
$oldsymbol{Z}$:	= 59 ((Pr)															
	115	0.24	0.00	-0.06	0.02	0.260	0.000	0.101		-2.36	1.11		-4.40			1.07	-4.10
	116			-0.06	0.02	0.282	0.000	0.106		-2.81	1.18		-10.77				-10.52
	117 118			-0.05 -0.05	0.03	0.293 0.293	0.000 0.000		-0.008 -0.008		0.99 0.87		-18.96 -24.52				-18.71 -24.57
	119			-0.05	0.03	0.293	0.000		-0.003 -0.007		0.37		-24.32 -31.61				-24.37 -31.41
	120			-0.04	0.04	0.315	0.000		-0.020		0.85		-36.03				-35.88
	121			-0.03	0.04	0.316	0.000		-0.014		0.97		-41.96				-41.81
	122	0.29	0.00	-0.03	0.03	0.316	0.000		-0.014		1.10		-45.67				-45.56
	123			-0.02	0.03	0.316	0.000		-0.018		1.42		-50.72				-50.61
	124			-0.01	0.02	0.317	0.000		-0.011			1008.57					-53.83
	125 126	0.29 0.28		0.00 0.01	0.01	0.318 0.307	0.000		-0.005 -0.009			1021.11 1031.69					-58.31 -60.85
	126	0.28		0.01	0.01	0.307	0.000		-0.009 -0.009			1031.69					-60.85 -64.80
	128	0.27		0.02	0.00	0.296	0.000		-0.003				-66.79	-66.33	0.030		-66.84
	129	0.27	0.00	0.03	0.00	0.297	0.000	-0.005	-0.007	-1.18			-70.14		0.030	2.18	-70.19
71	130	0.26	0.00	0.03	0.00	0.285	0.000	-0.007	-0.007	-0.95	2.23	1074.64	-71.53	-71.18	0.064	2.22	-71.62
	131	0.24		0.03	0.00	0.263			-0.006				-74.28		0.052		-74.39
73	132	0.22	0.00	0.02	0.01	0.240	0.000	-0.002	-0.013	-0.11	2.32	1094.57	-75.32	-75.21	0.057	2.31	-75.46

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 59 ((Pr)															
	- 37 (133		0.00	0.02	0.01	0.229	0.000	-0.004	-0.013	0.08	2.26	1105.12	-77.80	-77.94	0.012	2.27	-77.96
	134		0.00	0.03	0.00	0.207		-0.021		-0.13		1113.72			0.035		-78.51
76	135	0.17	0.00	0.04	-0.01	0.185	0.000	-0.037	0.003	-0.21	1.87	1123.94	-80.47	-80.94	0.012	1.89	-80.68
	136		0.00		-0.01	0.163		-0.039	0.003	-0.55		1132.40			0.012		-81.10
78	137		0.00	0.03	-0.01	0.140		-0.030	0.006	-0.61	1.03	1142.21	-82.60	-83.18	0.012	1.04	-82.86
	138		0.00	0.03	-0.01	0.129		-0.031		-1.20		1150.44			0.014		-83.04
	139 140		0.00 0.00	0.01	0.00	0.075 0.064		-0.010 -0.010		-1.70 -2.84		1160.40 1168.53			0.008 0.006		-84.98 -85.06
	140		0.00	0.00	0.00	0.004	0.000	0.000	-0.001			1178.27			0.000		-85.06 -86.75
	142	-0.03		0.00	0.00	-0.032	0.000	0.000				1184.07			0.002		-84.50
84	143	0.03	0.00	0.00	0.00	0.032	0.000	0.000	0.000	-1.98	-1.18	1191.09	-83.05	-83.07	0.003	-1.18	-83.46
	144			-0.03	0.00		-0.097	0.044	0.009	-2.97		1196.40			0.003		-80.66
	145			-0.04	0.00		-0.097	0.058	0.011	-2.71	0.23	1203.47	-79.29	-79.63	0.007	0.31	-79.65
	146			-0.04	0.01		-0.110	0.061		-3.11		1209.25			0.062		-77.36
	147			-0.05	0.02		-0.096	0.076				1216.17			0.023		-76.19
	148			-0.06	0.02		-0.069		-0.002			1221.39			0.026		-73.34
	149 150			-0.07 -0.08	0.02	0.227 0.238	0.000 0.000	0.108 0.123		-3.39 -4.44		1228.10 1233.44			0.082 0.026		-71.94 -69.18
	151			-0.03 -0.07	0.02	0.238	0.000	0.123		-4.44 -4.26		1239.88			0.020		-67.57
	152			-0.07	0.02	0.260	0.000	0.114		-4.74		1244.70			0.122		-64.32
94	153	0.24	0.00	-0.07	0.03	0.259	0.000	0.115	-0.005	-4.54	0.25	1250.66	-61.91	-61.63	0.104	0.49	-62.17
	154			-0.06	0.03	0.270	0.000		-0.007			1255.13			0.152		-58.60
	155			-0.05	0.03	0.270	0.000	0.092	-0.010	-3.99		1260.60				0.45	-56.00
	156			-0.04	0.03	0.282	0.000			-4.15		1264.68					-52.03
	157			-0.03	0.03	0.282	0.000		-0.016			1269.85					-49.12
	158			-0.03	0.04	0.282	0.000		-0.026			1273.63					-44.76
100 101				-0.02 -0.01	0.04	0.282 0.294	0.000 0.000		-0.030 -0.032			1278.42 1281.92					-41.43 -36.85
102			0.00	0.00	0.04	0.295	0.000		-0.032			1286.39					-33.19
103			0.00	0.01	0.04	0.296	0.000	0.025	-0.039	-3.70		1289.46					-28.15
104	163	0.26	0.00	0.01	0.03	0.285	0.000	0.021	-0.030	-2.95	0.52	1293.48	-24.01			0.68	-24.14
105	164	0.26	0.00	0.02	0.03	0.285	0.000	0.009	-0.033	-2.97		1296.13				0.67	-18.67
106			0.00	0.02	0.02	0.274	0.000		-0.023			1299.84					-14.34
107 108			0.00 0.00	0.04 0.04	0.01 0.01	0.275 0.264			-0.019 -0.019			1302.23 1305.72	-8.55 -3.96			0.92 1.25	-8.63 -3.97
109 110			0.00 0.00	0.05 0.05	0.00	0.264 0.253			-0.012 -0.012			1307.84 1311.02	1.98 6.88			1.18 1.53	2.02 6.99
111			0.00		-0.00	0.233			-0.012 -0.004			1311.02	12.95			1.33	13.17
112			0.00		-0.01	0.231			-0.004			1316.05	17.99			1.59	18.29
113	172	0.21	0.00	0.07	-0.02	0.231	0.000	-0.068	0.004	-1.71	1.12	1317.91	24.20			1.34	24.65
114	173	0.19	0.00	0.07	-0.02	0.209	0.000	-0.071	0.005	-1.33	1.28	1320.71	29.47			1.54	30.02
115			0.00		-0.03	0.197		-0.073		-1.74		1322.53	35.72			1.08	36.44
116			0.00		-0.02	0.163		-0.064		-1.20		1325.04	41.28			1.18	41.99
117 118			0.00 0.00		-0.03 -0.02	0.163 0.152		-0.065 -0.065		-1.98 -1.98		1326.83 1329.43	47.56 53.03			0.51 0.31	48.44 53.95
119 120		0.13	0.00		-0.02 -0.02	0.141 0.119		-0.054 -0.044		-2.10		1330.63	59.90 65.49			-0.14 -0.44	60.87 66.53
		-0.11		0.04		-0.125		-0.006				1334.36	72.32			-1.26	73.31
		-0.07		0.01		-0.073		-0.010				1336.88	77.87			-1.79	78.99
123	182	-0.06	0.00	0.02	0.00	-0.063	0.000	-0.022	0.002	-4.06	-3.24	1338.68	84.15			-3.22	85.41
124	183	-0.06	0.00	0.02	0.01	-0.063	0.000	-0.022	-0.008	-4.87	-3.95	1341.14	89.76			-3.90	91.17
		-0.02		0.00		-0.021	0.000	0.000				1342.40	96.56			-5.08	98.06
		-0.01		0.00		-0.011	0.000	0.000				1344.49	102.54			-5.63	104.18
		-0.02 -0.01		0.00		-0.021 -0.011	0.000 0.000	0.000		-5.92		1343.71 1343.95	111.40			-4.93 -3.85	113.18
								0.000					119.22				121.16
129 130			0.00	0.00 -0.03	0.00	0.021	0.000 -0.097	0.000 0.040				1342.78 1342.96	128.46				130.55 138.80
	109	0.07	0.07	0.03	0.00	0.077	0.097	0.040	0.007	5.07	2.02	1374.70	150.50			1.03	130.00

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 59 ((Pr)															
		` '	0.09	-0.03	0.00	0.099	-0.125	0.043	0.010	-4.25	-1.76	1342.22	145.17			-1.50	147.84
				-0.04			-0.125	0.056				1342.56	152.91			-0.85	155.82
				-0.05			-0.139	0.069	0.005			1341.86	161.68			-0.74	164.86
				-0.05 -0.05			-0.139 -0.138	0.072 0.073	0.007 -0.003	-3.97 -4.01		1342.10 1341.33	169.50 178.35			-0.26 -0.32	172.88 181.93
				-0.09	-0.01		0.000	0.126	0.035			1341.78	185.97			0.17	190.16
				-0.09		0.196	0.000	0.127	0.025	-4.44		1341.03	194.79			-0.23	199.07
				-0.09		0.207	0.000	0.129	0.027			1341.34	202.55			-0.18	207.06
139	198	0.21	0.00	-0.08	0.01	0.228	0.000	0.120	0.016	-4.57	-1.12	1340.30	211.66			-0.57	216.16
\boldsymbol{Z}	= 60 ((Nd)															
				-0.05		0.304	0.000		-0.007		0.75	915.92					-10.11
				-0.05 -0.04		0.304 0.326	0.000 0.000		-0.007 -0.019		0.58 0.31		-16.43 -24.61				-16.14 -24.33
				-0.04		0.326	0.000		-0.019 -0.019		0.31		-24.01 -29.22				-24.33 -28.98
				-0.03	0.04	0.327	0.000			-3.85	0.48		-35.74				-35.51
63	123	0.30	0.00	-0.03	0.04	0.327	0.000	0.082	-0.023	-3.69	0.67	985.33	-39.50			0.63	-39.32
				-0.02		0.328	0.000			-3.13	0.94	999.15					-45.08
		0.30 0.29		-0.01		0.328	0.000			-2.89		1010.39					-48.29
		0.29		0.00		0.318 0.318	0.000 0.000		-0.015 -0.009			1023.60 1034.24					-53.45 -56.06
		0.29		0.02		0.319	0.000		-0.013			1046.84					-60.60
69		0.29		0.02		0.319	0.000		-0.003	-1.91		1056.93					-62.66
		0.29		0.03		0.320	0.000		-0.016			1068.89			0.028		-66.56
		0.30		0.02		0.330	0.000			-1.71		1078.33			0.028		-67.98
		0.26		0.02		0.285	0.000	-0.003		-0.64		1089.66 1098.85			0.024		-71.25 -72.40
		0.23 0.21		0.02		0.251 0.229	0.000 0.000	-0.001 -0.018		-0.16 0.21		1110.00			0.047		-72.40 -75.50
		0.20		0.03		0.218	0.000	-0.019		-0.06		1118.66			0.012		-76.13
		0.17		0.04				-0.037	0.003	-0.03		1129.37			0.012		-78.79
		0.16			-0.01		0.000	-0.038	0.003	-0.40		1137.89			0.011		-79.27
		0.13 0.12			-0.01			-0.030		-0.30		1148.26			0.012		-81.59
		0.12		0.03	-0.01	0.129	0.000 0.000	-0.031 0.001	0.006	-0.86 -1.14		1156.41 1167.07			0.026 0.028		-81.71 -84.33
		0.05		0.01		0.053						1175.23				-1.45	
82	142	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.67	-2.68	1185.55	-86.36	-85.96	0.002	-2.68	-86.72
				-0.01			0.000	0.012				1191.36				-1.82	
		0.00		0.00		0.000	0.000	0.000		-1.55		1199.01			0.002		-84.09
				-0.02 -0.04			-0.096 -0.083	0.030 0.058		-2.08 -2.04		1204.29 1211.91			0.002 0.002		-81.27 -80.80
				-0.04			-0.083	0.062		-2.18		1217.72			0.002		-78.56
88	148	0.18	0.06	-0.05	0.02	0.194	-0.082	0.078	-0.004	-2.46	0.93	1225.26	-77.65	-77.41	0.003	1.07	-77.99
				-0.06			-0.041			-2.72		1230.69			0.003		-75.36
				-0.07		0.237	0.000	0.110		-3.49		1238.15			0.003		-74.71
				-0.07 -0.07		0.249 0.260	0.000 0.000	0.112 0.114		-4.17 -4.55		1243.55 1250.67			0.003 0.025		-72.05 -71.07
				-0.07		0.259	0.000		-0.005			1255.65			0.027		-67.98
				-0.06		0.270	0.000		-0.007			1262.16			0.114		-66.42
95	155	0.25	0.00	-0.06	0.03	0.270	0.000	0.105	-0.007	-4.76	-0.12	1266.68	-62.56			0.09	-62.88
				-0.05		0.281	0.000					1272.80		-60.53	0.203		-60.88
				-0.05		0.281	0.000					1276.98					-56.99
				-0.03 -0.02		0.293 0.294	0.000 0.000					1282.73 1286.54					-54.67 -50.41
				-0.02 -0.02		0.294	0.000		-0.029 -0.029			1291.86					-30.41 -47.62
				-0.01		0.294	0.000					1295.38					-43.07
102	162	0.28	0.00	0.00	0.04	0.306	0.000	0.039	-0.035	-4.14	-0.04	1300.34	-39.73			0.20	-39.90
		0.27		0.01		0.296	0.000					1303.45					-34.91
104	164	0.27	0.00	0.01	0.03	0.296	0.000	0.023	-0.029	-3.40	0.28	1307.89	-31.13			0.46	-31.32

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 60 ((Nd)															
	165	` ′	0.00	0.02	0.03	0.285	0.000	0.009	-0.033	-3.19	0.30	1310.56	-25.74			0.48	-25.89
106	166	0.26	0.00	0.02	0.02	0.285	0.000	0.007	-0.023	-2.60	0.74	1314.70	-21.80			0.85	-21.98
	167		0.00	0.04	0.01	0.275			-0.019			1317.16					-16.34
	168		0.00	0.04	0.01	0.275			-0.019			1321.10					-12.15
	169		0.00	0.05	0.00	0.264			-0.012			1323.26	-6.14			1.07	-6.20
	170 171		0.00 0.00	0.05	0.00 -0.01	0.253 0.254		-0.038 -0.051	-0.012	-1.48 -1.74		1326.91 1328.85	-1.73 4.41			1.42 1.36	-1.71 4.51
	172		0.00		-0.01 -0.02	0.234		-0.051 -0.068		-1.74 -1.52		1328.83	8.92			1.61	9.19
	173		0.00		-0.02	0.231		-0.068	0.004			1334.27	15.13			1.32	15.46
114	174	0.20	0.00	0.07	-0.02	0.220	0.000	-0.069	0.005	-1.48	1.22	1337.57	19.90			1.47	20.32
115	175	0.18	0.00	0.07	-0.03	0.197		-0.073	0.016	-1.70	0.83	1339.29	26.25			1.15	26.82
	176		0.00		-0.03	0.186		-0.075	0.017			1342.28	31.33			1.36	32.01
	177 178		0.00		-0.03 -0.02	0.164 0.163		-0.077 -0.064	0.018	-2.07 -1.87		1344.04 1347.01	37.65 42.74			0.70 0.51	38.43 43.49
	179		0.00		-0.02	0.152		-0.053	0.012	-1.89		1348.17	49.66			0.14	50.44
	180	0.11			-0.02	0.119		-0.056	0.014	-1.80		1351.07	54.83			-0.07	55.74
121	181	-0.12	0.00	0.01		-0.125		-0.006		-2.10			61.58			-0.98	62.40
		-0.08		0.01		-0.084		-0.009	0.001	-2.31			66.82			-1.39	67.74
		-0.06		0.02		-0.063		-0.022	0.002			1357.02	73.09			-2.79	74.15
		-0.06		0.03		-0.063		-0.033	-0.007			1359.94	78.24			-3.45	79.48
	185 186		0.00 0.00	0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000	0.000 0.000			1361.20 1363.75	85.06 90.58			-4.63 -5.21	86.34 91.99
	187	-0.00		0.00	0.00	-0.011	0.000	0.000	0.000	-5.44		1362.93	99.47			-3.21 -4.44	101.02
	188		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.34		1363.63	106.83			-3.40	108.52
129	189	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-3.30	-2.43	1362.41	116.12			-2.43	117.96
130	190	0.07	0.07	-0.03	0.00	0.077	-0.097	0.040	0.007	-3.44	-1.59	1363.10	123.50			-1.39	125.68
	191			-0.03	0.00		-0.125	0.043				1362.39	132.30			-1.06	134.70
	192 193			-0.03 -0.05	0.00 0.00		-0.125 -0.126	0.043 0.069				1363.06 1362.36	139.69 148.46			-0.39 -0.22	142.27 151.34
	194			-0.05	0.00		-0.120 -0.139	0.009	0.014			1362.99	155.90			0.31	158.98
	195			-0.05	0.02		-0.138	0.073	-0.003	-3.44		1362.20	164.77			0.28	168.04
	196			-0.08	-0.01	0.196	0.000	0.114	0.033			1363.09	171.95			0.59	175.67
	197			-0.08	0.00	0.206	0.000	0.116				1362.36	180.74				184.54
	198			-0.08 -0.08	0.01	0.216		0.118				1363.06					192.09
	199				0.01	0.228	0.000	0.120				1362.30					201.12
	200 201			-0.08 -0.07	0.02	0.227 0.237	0.000 0.000	0.120 0.110				1362.89 1361.91					208.83 217.96
			0.00	-0.07	0.02	0.237	0.000	0.110	0.003	-4.42	-1.22	1501.91	213.49			-0.79	217.90
	= 61 (` '	0.00	0.04	0.04	0.215	0.000	0.001	0.020	2.04	0.21	006.56	5.50			0.11	5 41
	120 121			-0.04 -0.04	0.04	0.315 0.326	0.000 0.000		-0.020 -0.029		0.21		-5.73 -14.06				-5.41 -13.73
	122			-0.04	0.05	0.326	0.000		-0.029		-0.10 -0.11		-14.00 -19.57				-13.73 -19.55
	123			-0.03	0.05	0.338	0.000		-0.031		0.01		-26.51				-26.25
63	124	0.31	0.00	-0.02	0.05	0.339	0.000	0.074	-0.035	-4.26	0.20	984.02	-30.90			0.12	-30.69
	125			-0.01	0.04	0.340	0.000		-0.030		0.47		-36.75				-36.55
	126		0.00	0.00	0.04	0.341	0.000		-0.033			1009.80					-40.39
	127 128		0.00	0.00	0.03	0.329 0.330	0.000 0.000		-0.024 -0.018			1023.12 1034.33					-45.64 -48.83
	128		0.00	0.01	0.02	0.330	0.000		-0.018 -0.012			1034.33					-48.83 -53.47
	130		0.00	0.02	0.01	0.319	0.000		-0.012			1057.71					-56.13
	131		0.00	0.02	0.01	0.320	0.000		-0.013			1069.78					-60.14
71	132		0.00	0.03	0.00	0.343	0.000		-0.006			1079.86					-62.20
	133		0.00	0.02	0.01	0.342	0.000		-0.012				-65.54		0.050		-65.58
	134	0.30		0.01	0.01	0.330	0.000		-0.009				-66.94		0.058		-67.03
	135 136		0.00	0.03	0.00 -0.01	0.229 0.229		-0.018 -0.019		0.14 -0.17			-69.90 -71.16		0.059 0.078		-69.99
	130		0.00		-0.01 -0.01	0.229		-0.019 -0.034		-0.17 -0.22			-71.16 -73.89		0.078		-71.30 -74.05
	138		0.00		-0.01	0.185		-0.037		-0.37			-74.83		0.027		-75.01

$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
19 10 -0.15 0.00 0.04 0.02 -0.156 0.000 -0.037 -0.012 -0.06 0.88 160.06 -77.80 -78.21 0.037 0.90 -78.81 80 141 0.05 0.00 0.001 0.00 0.000	Z	= 61 ((Pm)															
88 144	78	139	0.14	0.00	0.03	-0.01	0.151	0.000	-0.029	0.005	-0.19	1.42	1151.38	-77.19	-77.50	0.013	1.42	-77.41
81 142 0.05 0.00 0.00 0.00 0.00 0.000																		
182 143 0.00 0.00 0.00 0.00 0.00 0.000																		
84 145 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.111 -0.44 1203.83 -81.21 -81.27 0.003 -0.44 -81.6 85 146 0.09 0.07 -0.02 0.00 0.089 -0.096 0.092 0.006 -1.58 0.46 129.771 -79.03 -79.46 0.002 0.50 -79.4 0.006 0.79 -0.005 0.006																		
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78 140 -0.16 0.00 0.03 0.02 -0.166 0.000 -0.025 -0.014 -0.	
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86 148 0.16 0.00 -0.04 0.00 0.172 0.000 0.060 0.009 -0.	
87 149 0.17 0.03 -0.04 0.01 0.183 -0.041 0.062 0.001 -1.	
88 150 0.19 0.04 -0.04 0.02 0.205 -0.055 0.066 -0.008 -1.	
89 151 0.21 0.02 -0.05 0.02 0.227 -0.027 0.082 -0.004 -2.	
90 152 0.22 0.00 -0.06 0.02 0.237 0.000 0.097 -0.000 -2.	
91 153 0.24 0.00 -0.06 0.03 0.259 0.000 0.102 -0.008 -3. 92 154 0.25 0.00 -0.06 0.03 0.270 0.000 0.105 -0.007 -4.	
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94 156 0.26 0.00 -0.05 0.03 0.282 0.000 0.094 -0.009 -4.	
95 157 0.26 0.00 -0.05 0.04 0.281 0.000 0.095 -0.020 -4.	
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	.74 -0.12 1335.62 -36.21 -0.01 -36.5
106 168 0.26 0.00 0.03 0.02 0.286 0.000 -0.004 -0.026 -3.	.14 0.21 1340.40 -32.92 0.34 -33.2

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	eta_2	eta_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	$M_{\rm exp}$ (MeV)	σ_{exp} (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
	= 62 ((Sm)															
	169	` ′	0.00	0.04	0.01	0.275	0.000	-0.020	-0.019	-2.99	0.25	1343.29	-27.75			0.34	-28.05
			0.00	0.05	0.00	0.276			-0.012			1347.76					-24.39
109			0.00	0.06	0.00	0.277		-0.045		-2.83		1350.44					-18.94
110 111		0.24 0.24			-0.01 -0.02	0.265 0.265		-0.049 -0.062		-2.21 -2.47		1354.56 1356.98	-14.79 -9.15			1.08	-14.94 -9.19
112113		0.23	0.00		-0.02 -0.02	0.254 0.231		-0.064 -0.068	0.002 0.004	-1.99 -2.00		1360.92 1363.22	-5.02 0.75			1.37 1.16	-4.99 0.84
	176	0.21			-0.02	0.231		-0.069	0.004	-2.80		1367.03	5.02			1.37	5.24
115			0.00		-0.03	0.220		-0.070	0.014	-1.98		1369.17	10.95			1.06	11.23
116	178	0.18	0.00	0.07	-0.03	0.197	0.000	-0.073	0.016	-1.66	0.85	1372.76	15.43			1.17	15.81
117	179	0.15	0.00	0.07	-0.03	0.164	0.000	-0.077	0.018	-1.87	0.57	1374.62	21.64			0.90	22.12
	180		0.00		-0.03	0.163		-0.065	0.020	-1.74		1378.16	26.17			0.73	26.68
119			0.00		-0.03	0.163		-0.065	0.020	-1.95		1379.73	32.68			0.48	33.27
		-0.17 -0.14		0.02 0.01		-0.177 -0.146		-0.011 -0.004	0.012	-1.62 -1.91		1382.95 1384.70	37.52 43.85			0.17 -0.54	37.96 44.33
		-0.14 -0.12															
		-0.12 -0.06		0.01 0.02		-0.125 -0.063		-0.006 -0.022	0.001 0.002	-2.11 -3.07		1388.09 1390.20	48.53 54.48			-1.02 -2.27	49.11 55.18
		-0.06		0.02	0.00	-0.063	0.000	-0.022	-0.002			1393.54	59.22			-2.92	60.04
125		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-4.99		1395.21	65.62			-4.01	66.50
126	188	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.62	-4.57	1398.20	70.70			-4.57	71.70
127	189	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-4.69	-3.72	1397.77	79.21			-3.73	80.33
	190		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.58		1398.92	86.12			-2.68	87.37
	191		0.06		0.00	0.044		0.014	0.003	-3.31		1398.28	94.83			-1.76	96.30
	192 193			-0.02 -0.03	0.00 0.00		-0.110 -0.124	0.028 0.042	0.007	-3.08 -3.29		1399.47 1399.22	101.72 110.04			-0.87 -0.56	103.40 111.94
	194 195			-0.03 -0.04	0.01		-0.138 -0.125	0.043 0.056	0.001 0.012	-2.88 -2.62		1400.30 1399.89	117.03 125.51			0.17 0.38	119.11 127.76
	196			-0.04	0.00		-0.123	0.058	0.004	-2.42		1400.89	132.59			0.99	135.03
135	197			-0.07	-0.01	0.185	0.000	0.100	0.029	-2.28	0.59	1400.53	141.01			1.09	143.77
136	198	0.18	0.00	-0.08	-0.01	0.196	0.000	0.114	0.033	-2.87	0.50	1401.99	147.62			1.16	150.71
	199	0.19	0.00	-0.08	0.00	0.206	0.000	0.116	0.023	-3.30	0.18	1401.71	155.98			0.73	159.14
	200			-0.07	0.00	0.217	0.000	0.105	0.022	-2.96		1402.80	162.96			0.71	166.19
139	201			-0.07 -0.07	0.01 0.02	0.227 0.227	0.000 0.000	0.107 0.108		-3.49		1402.44 1403.53	171.39			0.23	174.76
	202			-0.07 -0.06	0.02	0.227	0.000					1403.33					181.96 190.65
	204			-0.06	0.03	0.248	0.000					1404.00					198.01
	205			-0.05	0.03	0.248	0.000		-0.013				202.83				206.91
	206			-0.05	0.04	0.259	0.000					1404.10					214.55
	207			-0.04	0.04	0.259	0.000		-0.025				219.02				223.65
146	208	0.24	0.00	-0.04	0.05	0.259	0.000	0.079	-0.035	-5.03	-2.27	1403.95	226.38			-1.56	231.49
\boldsymbol{Z} :	= 63 ((Eu)															
	125			-0.02	0.05	0.339	0.000		-0.035				-7.49				-7.08
	126			-0.01	0.05	0.340	0.000		-0.039		0.12	980.58					-12.77
	127		0.00	0.00	0.04	0.341	0.000		-0.033		0.33	995.55					-19.45
	128 129		0.00 0.00	0.01 0.02	0.03	0.330 0.331	0.000 0.000		-0.028 -0.022			1008.03 1022.14					-23.91 -29.98
	130 131		0.00 0.00	0.03	0.01	0.331 0.320	0.000		-0.016 -0.016			1034.31 1047.79					-34.13 -39.55
	131		0.00	0.03	0.00	0.320			-0.010 -0.010			1047.79					-39.33 -42.99
	133		0.00	0.05	0.00	0.321			-0.013			1072.07					-47.75
71	134	0.30	0.00	0.04	0.00	0.332	0.000	-0.009	-0.010	-2.42	1.33	1082.76	-50.49			1.26	-50.43
72	135	0.30	0.00	0.04	0.00	0.332	0.000	-0.009	-0.010	-2.00	1.69	1094.85	-54.51			1.65	-54.46
	136		0.00	0.03	0.00	0.320	0.000		-0.006			1105.09					-56.68
	137		0.00	0.03	0.00	0.252			-0.006			1116.89		(1.77	0.000		-60.41
	138 139		0.00 0.00		-0.01 -0.01	0.229 0.218		-0.031 -0.032		-0.54 -0.43		1126.68 1138.04			0.028		-62.17 -65.49
11	140	0.18	0.00	0.04	-0.02	0.196	0.000	-0.036	0.012	-0.56	1.61	1147.64	-66.94	-66.99	0.052	1.60	-67.05

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 63 ((Eu)															
		-0.17	0.00	0.03	0.02	-0.176	0.000	-0.024	-0.013	-0.39	1.43	1158.63	-69.86	-69.93	0.013	1.43	-70.00
		-0.16		0.03	0.02	-0.166			-0.014			1167.89			0.031	0.97	-71.22
		-0.13		0.02		-0.135			-0.007			1178.72			0.011		-74.02
	144	-0.06	0.00	0.01	0.00	-0.063 0.011	0.000	-0.010 0.000		-1.47 -2.72		1188.26 1199.14			0.011 0.004		-75.53 -78.37
	146	-0.03		0.00	0.00	-0.032	0.000	0.000		-1.77		1206.18			0.006		-77.37
	147			-0.00	0.00	0.043	-0.068	0.000	0.000	-1.77 -1.14		1214.54			0.003		-77.67
	148	0.14	0.00	-0.03	-0.01	0.151	0.000	0.045		-0.88		1221.05			0.010		-76.13
	149			-0.03	0.00	0.183	0.000	0.049	0.008	-0.80		1229.67			0.004		-76.70
	150			-0.03	0.01	0.194	0.000			-0.88		1236.52			0.006		-75.51
	151			-0.04	0.02	0.215			-0.008	-1.32		1244.88			0.002		-75.79
	152 153			-0.04 -0.05	0.02	0.226 0.249	0.000 0.000		-0.007 -0.002			1251.53 1259.69			0.002 0.002		-74.39 -74.47
	154			-0.05	0.02	0.249	0.000		-0.002			1266.21			0.002		-72.94
92	155			-0.05	0.03	0.270	0.000	0.092	-0.010	-3.55	0.69	1274.08	-72.31	-71.82	0.002	0.81	-72.72
93	156	0.25	0.00	-0.05	0.03	0.270	0.000	0.092	-0.010	-3.88	0.39	1280.16	-70.32	-70.09	0.006	0.50	-70.75
	157			-0.04	0.03	0.282	0.000		-0.013			1287.46			0.005		-69.98
	158			-0.04	0.03	0.282	0.000		-0.013			1293.17			0.077		-67.64
	159 160			-0.03 -0.03	0.03 0.04	0.282 0.293	0.000 0.000		-0.016 -0.026			1300.03 1305.51		-66.05	0.007		-66.44 -63.81
	161			-0.02	0.04	0.294	0.000		-0.029			1312.02					-62.24
	162			-0.02	0.04	0.294	0.000		-0.032								-59.11
100			0.00		0.04	0.306	0.000		-0.035								-57.12
101			0.00	0.01	0.04	0.307	0.000		-0.039								-53.67
102	165	0.28	0.00	0.01	0.04	0.307	0.000	0.027	-0.039	-4.75	-0.67	1333.37	-50.89			-0.47	-51.24
103			0.00	0.02	0.04	0.308	0.000		-0.042								-47.34
104 105			0.00 0.00	0.02	0.03	0.297	0.000		-0.032 -0.026								-44.41
105			0.00	0.03	0.02	0.297 0.286			-0.026 -0.026								-40.08 -36.82
107			0.00	0.04	0.01	0.287			-0.019								-32.13
108	171	0.25	0.00	0.05	0.00	0.276	0.000	-0.033	-0.012	-3.01	0.27	1359.10	-28.20			0.35	-28.54
109		0.25	0.00	0.06	0.00	0.277	0.000	-0.045	-0.015	-3.17	0.28	1362.22	-23.24			0.38	-23.52
110			0.00		-0.01	0.265			-0.005			1366.38					-19.56
111 112			0.00 0.00		-0.02 -0.02	0.265 0.254		-0.062 -0.064	0.002	-2.77 -2.25		1369.24 1373.19					-14.27 -10.08
113 114			0.00 0.00		-0.02 -0.03	0.231 0.231		-0.068 -0.069		-2.17 -1.97		1375.87 1379.71	-4.61 -0.37			1.02 1.24	-4.64 -0.28
115			0.00		-0.03	0.220		-0.070		-2.11		1382.28	5.13			0.95	5.28
116			0.00		-0.03	0.197		-0.073		-1.74		1385.87	9.61			1.11	9.86
117	180	0.17	0.00	0.07	-0.03	0.186	0.000	-0.075	0.017	-2.04	0.62	1388.09	15.46			0.91	15.77
118			0.00		-0.02	0.163		-0.064		-1.62		1391.61	20.01			0.75	20.31
119			0.00		-0.02	0.163		-0.052		-1.58		1393.75	25.94			0.33	26.26
		-0.17 -0.14		0.02		-0.177 -0.146		-0.011 -0.015		-1.67		1397.02 1399.18	30.74 36.66			0.14 -0.51	31.04 37.01
		-0.14 -0.12		0.02		-0.140 -0.125		-0.013				1402.54	41.37			-0.91	41.80
		-0.08		0.02		-0.084		-0.021				1404.99	46.99			-2.09	47.52
		-0.06		0.02		-0.063		-0.022	-0.008				51.73			-2.70	52.38
125			0.00		0.00	0.000	0.000	0.000				1410.43	57.69			-3.79	58.41
126			0.00	0.00	0.00	0.000	0.000	0.000				1413.43	62.77			-4.33	63.59
	190			0.00		-0.011	0.000	0.000				1413.41	70.86			-3.48	71.79
128			0.00		0.00	0.000	0.000	0.000				1414.59	77.75			-2.43	78.79
129				-0.02	0.00		-0.096 -0.124	0.026				1414.53	85.88 92.77			-1.62 -0.71	87.17 94.27
130 131				-0.02 -0.03	0.00		-0.124 -0.137	0.029 0.042				1415.70 1415.91	100.64			-0.71 -0.46	102.32
132				-0.03	0.01		-0.138	0.043		-2.72		1416.98	107.64			0.28	109.47
133				-0.04	0.01		-0.138	0.056	0.003	-2.75		1416.93	115.76			0.57	117.77
134				-0.05	0.01		-0.139	0.069		-2.42		1417.97					125.02

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z :	= 63 ((En)															
135		` ′	0.00	-0.07	-0.01	0.185	0.000	0.100	0.029	-2.16	0.79	1418.00	130.84			1.25	133.31
136						0.185	0.000	0.113		-2.58		1419.46	137.44			1.31	140.22
137				-0.07	0.00	0.206	0.000	0.103		-2.73		1419.50	145.48			0.87	148.21
138				-0.07	0.00	0.217	0.000	0.105		-2.86		1420.75	152.30			0.83	155.22
139				-0.06	0.01	0.227	0.000	0.094		-3.01		1420.68	160.43			0.36	163.38
140				-0.05	0.01	0.238	0.000	0.084		-2.91		1421.77	167.42			0.19	170.47
141 142				-0.05 -0.05	0.02	0.237 0.248	-0.014 0.000		-0.003 -0.013	-3.45		1421.74 1422.76	175.52 182.58			-0.32 -0.43	178.77 186.12
143				-0.05	0.03	0.248	0.000		-0.013	-4.33		1422.54	190.86			-0.97	194.59
144	207			-0.04	0.04	0.259	0.000	0.078	-0.025	-4.39		1423.33	198.14			-1.02	202.19
145	208	0.24	0.00	-0.04	0.04	0.259	0.000	0.078	-0.025	-4.93	-1.96	1422.93	206.61			-1.55	210.86
146	209	0.24	0.00	-0.04	0.05	0.259	0.000	0.079	-0.035	-5.08	-2.25	1423.67	213.95			-1.58	218.66
147				-0.03	0.05	0.271	0.000		-0.037				222.66			-2.07	227.55
148	211	0.25	0.00	-0.02	0.05	0.271	0.000	0.057	-0.040	-5.28	-2.61	1423.22	230.54			-1.96	235.68
$oldsymbol{Z}$:	= 64 ((Gd)															
	128		0.00	0.01	0.03	0.341	0.000		-0.027		0.69		-11.26				-10.84
	129	0.30		0.02	0.02	0.331	0.000		-0.022			1007.01					-15.52
	130	0.30		0.03	0.01	0.331	0.000		-0.016			1021.83					-22.28
	131 132	0.29 0.29		0.03 0.04	0.01	0.320 0.320	0.000		-0.016 -0.010			1034.29 1048.45					-26.72 -32.83
	133	0.29		0.05	0.00	0.320			-0.013			1059.98					-36.35
	134	0.29		0.03	-0.00	0.321			-0.013 -0.007			1039.98					-30.33 -41.78
	135	0.27		0.05	0.00	0.299			-0.013			1084.29					-44.58
72	136	0.27		0.05	-0.01	0.298	0.000	-0.030	-0.003	-1.72	1.50	1096.99	-49.36				-49.23
73	137	0.24	0.00	0.05	-0.01	0.264	0.000	-0.037	-0.002	-1.16	1.58	1107.37	-51.67			1.55	-51.58
74	138	0.23	0.00	0.04	-0.01	0.252	0.000	-0.027	0.001	-0.67	1.72	1119.70	-55.93			1.71	-55.87
	139	0.21			-0.01	0.230		-0.043		-0.81		1129.58					-57.72
	140	0.20			-0.01	0.218		-0.032	0.002	-0.54		1141.54			0.028		-61.64
	141 142	0.19 -0.17		0.04	-0.01	0.207 -0.176		-0.034 -0.023		-0.72 -0.40		1151.18 1162.72			0.020 0.028		-63.25 -66.75
		-0.16		0.03		-0.166			-0.014			1172.10			0.200		-68.09
		-0.16 -0.14		0.03		-0.166 -0.146			-0.014 -0.007			1172.10			0.200		-08.09 -71.47
		-0.06		0.01		-0.063		-0.010		-1.53		1193.05			0.019		-72.99
82	146	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.80	-1.91	1204.52	-76.18	-76.09	0.005	-1.91	-76.42
83	147	-0.03	0.00	0.00	0.00	-0.032	0.000	0.000	0.000	-1.81	-1.05	1211.60	-75.19	-75.36	0.003	-1.05	-75.46
	148		0.00	0.00	0.00	0.000	0.000	0.000				1220.53			0.003	-0.06	-76.35
	149			-0.03		0.140	0.000	0.043		-0.67		1226.96			0.004		-74.72
	150			-0.03	-0.01	0.172	0.000	0.047		-0.60		1235.97			0.006		-75.67
	151 152			-0.03 -0.03	0.01	0.194 0.205	0.000		-0.002 -0.001			1243.03 1251.85			0.004 0.003		-74.70 -75.46
	153			-0.04	0.02	0.226	0.000		-0.007			1258.55			0.003		-74.10
	154			-0.04	0.02	0.220	0.000		-0.007 -0.007			1267.20			0.003		-74.10 -74.69
	155			-0.05	0.02	0.249	0.000		-0.002			1273.73			0.003		-73.15
	156	0.24	0.00	-0.05	0.02	0.260	0.000	0.089	-0.001	-2.88	1.04	1282.10	-73.04	-72.54	0.003		-73.45
93	157	0.25	0.00	-0.04	0.02	0.271	0.000	0.079	-0.004	-3.13	0.74	1288.25	-71.13	-70.83	0.003	0.82	-71.57
	158			-0.04	0.03	0.282	0.000		-0.013			1296.12			0.003		-71.34
	159			-0.03	0.03	0.282	0.000		-0.016			1301.89			0.003		-69.08
	160			-0.03	0.03	0.282	0.000		-0.016			1309.34			0.003		-68.44
	161 162			-0.02 -0.01	0.03	0.294 0.294	0.000 0.000					1314.85 1321.91			0.003 0.005		-65.92 -64.89
	163			-0.01	0.03	0.294	0.000					1327.00		31.27	0.003		-61.87
100			0.00	-0.01 0.00	0.04	0.294	0.000					1327.00					-61.87 -60.42
101			0.00	0.00	0.04	0.293	0.000					1338.35					-57.05
102		0.28		0.02	0.04	0.308	0.000					1344.59					-55.17
103		0.28	0.00	0.03	0.03	0.309	0.000	0.002	-0.036	-4.77	-0.79	1348.81	-50.97			-0.63	-51.39
104	168	0.27	0.00	0.03	0.03	0.298	0.000	-0.001	-0.036	-4.28	-0.55	1354.55	-48.64			-0.37	-49.02
105	169	0.27	0.00	0.04	0.02	0.298	0.000	-0.014	-0.029	-4.30	-0.60	1358.38	-44.40			-0.48	-44.81

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 64 ((Gd)															
	170	0.26	0.00	0.04	0.01	0.287	0.000	-0.018	-0.019	-3.67	-0.30	1363.73	-41.68			-0.21	-42.11
107	171	0.26	0.00	0.05	0.01	0.287	0.000	-0.030	-0.022	-3.95	-0.39	1367.29	-37.16			-0.28	-37.56
	172	0.25		0.05	0.00	0.276			-0.012			1372.27					-34.46
109		0.25		0.06	0.00	0.277			-0.015			1375.50					-29.56
110		0.25			-0.01	0.277			-0.009			1380.14					-26.06
111	175	0.24 0.23	0.00		-0.02 -0.03	0.265 0.254		-0.062 -0.077	0.002	-3.14 -2.94		1383.02 1387.48					-20.82 -17.06
113		0.23			-0.03 -0.02	0.234		-0.077 -0.068		-2.94 -2.47		1390.10					-17.66 -11.65
114			0.00		-0.03	0.231		-0.069				1394.37	-7.74			0.98	-7.74
115	179	0.20	0.00	0.08	-0.03	0.220	0.000	-0.082	0.012	-2.68	0.41	1397.01	-2.32			0.71	-2.21
116	180	0.19	0.00	0.07	-0.03	0.208		-0.072	0.015	-2.04		1400.93	1.84			0.94	1.97
117			0.00		-0.03	0.186		-0.075		-2.18		1403.37	7.47			0.58	7.68
118		0.15 -0.18			-0.02	0.163 -0.187		-0.064 -0.021	0.010	-1.69 -1.63		1407.06 1409.12	11.85 17.86			0.69 0.31	12.03 17.98
		-0.13				-0.137 -0.177		-0.021		-1.81		1413.01	22.05			0.04	22.22
		-0.15		0.02		-0.156		-0.014	0.003	-2.10			28.01			-0.53	28.23
		-0.12		0.02		-0.125		-0.006				1418.89	32.31			-0.94	32.60
123	187	-0.08	0.00	0.02	0.00	-0.084	0.000	-0.021		-2.90			37.93			-2.05	38.32
		-0.06		0.02		-0.063	0.000	-0.022		-3.52			42.29			-2.61	42.78
	189	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1427.10	48.31			-3.61	48.86
126 127	190	0.00 -0.02		0.00	0.00	0.000 -0.021	0.000 0.000	0.000		-5.14			52.97			-4.12 -3.29	53.62
127			0.00	-0.01 0.00	0.00	-0.021 0.000	0.000	0.012	-0.000 0.000	-4.22 -3.07		1430.54 1432.11	61.01 67.51			-3.29 -2.20	61.77 68.37
	193			-0.02	0.00		-0.096	0.026	0.004	-3.24		1432.04	75.65			-1.36	76.76
130	194	0.05	0.08	-0.02	0.00		-0.110	0.027	0.006			1433.60	82.16			-0.45	83.42
131	195	0.07	0.10	-0.02	0.01	0.079	-0.137	0.030	-0.001	-3.00	-0.37	1433.79	90.04			-0.14	91.49
132				-0.03	0.01		-0.138	0.043		-2.41	0.34	1435.30	96.61			0.61	98.23
133				-0.04	0.00		-0.125	0.056		-2.17		1435.27	104.71			0.87	106.47
134 135				-0.05 -0.07	0.01 -0.01	0.131	-0.125 0.000	0.070 0.098	0.005	-1.84 -1.71		1436.69 1436.70	111.36 119.42			1.51 1.64	113.32 121.64
136				-0.07		0.174	0.000	0.100	0.027	-1.81		1438.55	125.64			1.61	128.04
137				-0.07		0.185	0.000	0.100	0.029	-2.36		1438.74	133.52			1.01	136.08
138				-0.07	0.00	0.206	0.000	0.103		-2.32		1440.31	140.03			1.21	142.68
139				-0.06	0.01	0.227	0.000	0.094		-2.60		1440.25					150.83
140	204	0.22	0.00	-0.05	0.01	0.238	0.000	0.084	0.007	-2.53	0.37	1441.75	154.73			0.58	157.50
141				-0.05	0.02	0.237	0.000		-0.003				162.81			0.06	165.78
142 143	206			-0.05 -0.04	0.02	0.237 0.248	0.000 0.000		-0.003 -0.016				169.55 177.79			-0.05 -0.59	172.72 181.16
143				-0.04	0.03	0.248	0.000		-0.016 -0.025				184.62				188.35
145				-0.03	0.04	0.260	0.000		-0.028				193.06			-1.22	196.96
146	210	0.24	0.00	-0.03	0.04	0.260	0.000	0.066	-0.028	-4.42	-1.67	1444.67	200.24			-1.26	204.35
147				-0.02	0.04	0.271	0.000		-0.031				208.99			-1.69	213.28
	212			-0.02	0.04	0.271	0.000		-0.031				216.41			-1.67	220.92
149				-0.01	0.04	0.272	0.000		-0.034				225.37				230.10 238.05
130	214	0.23	0.00	0.00	0.04	0.273	0.000	0.032	-0.037	-4.63	-2.30	1444.12	233.07			-1.00	238.03
	= 65 (
	130		0.00	0.03	0.02	0.331	0.000		-0.026			1003.79					-5.17
	131 132	0.29	0.00	0.03	0.01	0.320 0.321	0.000		-0.016 -0.020			1019.22 1032.08					-12.31 -17.17
	133	0.29		0.04	0.00	0.321			-0.020 -0.013			1032.08					-17.17 -23.59
	134	0.29			-0.01	0.322			-0.007			1058.81					-27.83
70	135	0.29	0.00	0.06	-0.01	0.322	0.000	-0.037	-0.007	-3.27	0.43	1072.34	-33.56			0.36	-33.31
	136	0.28	0.00		-0.01	0.310			-0.007		0.65	1083.73	-36.88			0.57	-36.68
	137	0.27			-0.01	0.299			-0.007			1096.53					-41.43
	138	0.25			-0.01	0.275			-0.003			1107.39					-44.27
	139		0.00		-0.02	0.252		-0.040		-1.24		1119.81		EO 40	0.000		-48.63
/5	140	0.22	0.00	0.05	-0.01	0.241	0.000	-0.041	-0.002	-1.28	1.35	1130.26	-51.13	-50.48	0.800	1.32	-51.06

N	A	$arepsilon_2$	ϵ_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 65 ((Tb)															
	141	` '	0.00	0.05	-0.02	0.230	0.000	-0.044	0.009	-1.14	1.43	1142.19	-54.99	-54.54	0.105	1.42	-54.95
	142		0.00		-0.02	0.207		-0.047		-1.10		1152.34		60.42	0.060		-57.06
		-0.17 -0.16		0.03		-0.176 -0.166			-0.004 -0.004			1163.80 1173.77			0.060 0.028		-60.50 -62.44
		-0.15		0.03		-0.156			-0.005			1185.21			0.057		-65.84
81	146	-0.06	0.00	0.00	0.00	-0.063	0.000	0.001	0.000	-1.41	-0.75	1195.21	-67.65	-67.77	0.045	-0.75	-67.80
		-0.02		0.00		-0.021	0.000	0.000		-2.53		1206.63			0.012		-71.19
		-0.04 -0.05				-0.042 -0.052	0.000 0.000		-0.001 -0.001	-1.69 -0.55		1214.36 1223.28			0.014 0.004		-70.88 -71.77
	150			-0.03	-0.00	0.052	0.000	0.045		-0.77		1230.43			0.004		-70.86
86	151	0.16	0.00	-0.03	0.00	0.172	0.000	0.048	0.007	-0.57	1.43	1239.57	-71.65	-71.63	0.005	1.45	-71.96
	152			-0.02	0.00	0.194	0.000	0.038		-0.57		1247.16			0.040		-71.53
	153			-0.02	0.02	0.216	0.000		-0.013			1256.11			0.004 0.045		-72.41
	154 155			-0.03 -0.03	0.02	0.227 0.238	0.000	0.057	-0.010 0.001	-1.21 -1.42		1263.34 1272.04			0.043		-71.60 -72.25
	156			-0.04	0.02	0.249	0.000		-0.006			1279.06			0.004		-71.21
92	157	0.24	0.00	-0.04	0.02	0.260	0.000	0.076	-0.005	-2.53	1.06	1287.48	-71.14	-70.77	0.003	1.13	-71.57
	158			-0.04	0.02	0.271	0.000		-0.004			1294.15			0.003		-70.19
	159 160			-0.03 -0.02	0.02	0.271 0.283	0.000 0.000		-0.007 -0.010			1302.08 1308.35			0.003 0.003		-70.06 -68.31
	161			-0.02	0.02	0.283	0.000		-0.010			1315.92			0.003		-67.79
	162			-0.02	0.03	0.283	0.000		-0.020						0.036		-65.74
	163		0.00	0.00	0.03	0.295	0.000		-0.026			1329.15			0.005		-64.88
	164 165		0.00 0.00	0.00 0.01	0.03	0.295 0.296	0.000		-0.026 -0.029					-62.08	0.100		-62.42 -61.02
	166		0.00	0.01	0.03	0.290	0.000		-0.029 -0.032					57 76	0.100		-51.02 -58.18
	167		0.00	0.02	0.03	0.297	0.000		-0.032 -0.032					-37.76	0.100		-56.40
	168		0.00	0.03	0.03	0.298			-0.036								-53.15
	169		0.00	0.03	0.03	0.298			-0.036								-50.89
	170		0.00	0.04	0.02	0.298			-0.029								-47.25
	171 172		0.00 0.00	0.04 0.05	0.01	0.287 0.287			-0.019 -0.022								-44.54 -40.56
	173		0.00	0.06	0.00	0.277			-0.015								-37.52
109	174		0.00		0.00	0.277	0.000	-0.045	-0.015	-3.97	-0.50	1386.25	-32.69			-0.40	-33.10
110	175	0.25	0.00	0.07	-0.01	0.277	0.000	-0.059	-0.009	-3.69	-0.08	1390.92	-29.29				-29.63
	176		0.00		-0.01	0.266			-0.008								-24.90
	177 178		0.00 0.00		-0.03 -0.03	0.266 0.254		-0.075 -0.077		-3.41 -3.38		1398.69 1401.84					-21.09 -16.13
	179		0.00		-0.03	0.231		-0.069		-2.56		1406.05					-12.24
115	180	0.20	0.00	0.08	-0.03	0.220	0.000	-0.082	0.012	-2.95	0.20	1409.11	-7.12			0.47	-7.13
	181		0.00		-0.03	0.209		-0.084		-2.59		1413.08	-3.03			0.73	-2.96
	182 183		0.00 0.00		-0.03 -0.02	0.197 0.163		-0.073 -0.064		-2.48 -1.80		1415.89 1419.57	2.23 6.63			0.40 0.58	2.31 6.69
		-0.18				-0.187		-0.064 -0.021		-1.80 -1.82		1419.57	12.13			0.38	12.13
		-0.17				-0.177		-0.011		-1.98		1426.05	16.29			-0.10	16.34
		-0.15		0.02	-0.01	-0.156		-0.014				1428.58	21.83			-0.63	21.95
		-0.12		0.01		-0.125		-0.006				1432.30	26.18			-0.97	26.34
		-0.08 -0.06		0.02 0.02		-0.084 -0.063		-0.021	0.002 -0.008			1435.16	31.40 35.75			-2.05 -2.59	31.65 36.10
	190	0.01		0.02	0.00		-0.013					1441.22	41.48			-2.39 -3.43	41.89
	191	0.00		0.00	0.01		-0.013		-0.010				46.13			-3.92	46.64
127	192	-0.02	0.00	-0.01		-0.021	0.000	0.012	-0.000	-4.04	-3.13	1445.12	53.72			-3.12	54.31
	193		0.02		0.00		-0.027	0.000				1446.70	60.21			-2.01	60.91
	194 195			-0.01 -0.03	0.01		-0.067 -0.111	0.013	-0.008			1447.00 1448.64	67.98 74.41			-1.18 -0.25	68.85 75.51
	196			-0.03	0.00		-0.111	0.041				1449.24	81.89			0.06	83.15
	190			-0.03	0.01		-0.137 -0.138	0.042		-2.90 -2.25		1449.24	88.42			0.78	89.82
	-																

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 65 (Tb)															
	198	. /	0.08	-0.04	0.00	0.120	-0.111	0.056	0.011	-1.81	0.75	1451.20	96.07			0.97	97.57
134	199	0.13	0.08	-0.05	0.01	0.142	-0.111	0.071	0.004	-1.55	1.32	1452.65	102.69			1.61	104.39
135						0.174	0.000	0.098		-1.72		1453.31	110.10			1.52	112.07
136				-0.07	-0.01	0.185	0.000	0.100		-1.79		1455.06	116.42			1.61	118.56
137				-0.07	0.00	0.195	0.000	0.101		-2.17		1455.53	124.02			1.29	126.22
138 139				-0.06 -0.06	0.00	0.206 0.216	0.000	0.090 0.093	0.017	-1.87 -2.36		1457.09 1457.50	130.53 138.19			1.26 0.85	132.80 140.59
140				-0.05	0.01	0.210	0.000	0.093		-2.30 -2.45		1457.30	144.72			0.65	147.21
	206			-0.05	0.02	0.237	0.000			-2.98		1459.43	152.41			0.14	155.08
142	207	0.22	0.00	-0.04	0.02	0.237	0.000	0.072	-0.007	-2.84	-0.14	1460.72	159.19			0.02	161.99
143				-0.04	0.03	0.248	0.000		-0.016				166.98			-0.52	170.03
144				-0.04	0.03	0.248	0.000		-0.016			1462.11	173.94			-0.58	177.20
145 146	210			-0.03 -0.02	0.04	0.260 0.260	0.000 0.000		-0.028 -0.031			1462.29 1463.13	181.84 189.07			-1.16 -1.15	185.39 192.82
147				-0.02	0.04	0.260	0.000		-0.031				197.30			-1.13	201.24
148				-0.01	0.04	0.261	0.000		-0.034				204.71			-1.67	208.87
149				-0.01	0.04	0.261	0.000					1463.16	213.25			-2.06	217.62
150	215	0.24		0.00	0.04	0.262	0.000	0.029	-0.037	-4.80			220.91			-1.95	225.52
151		0.25		0.01	0.04	0.273	0.000						229.64			-2.30	234.49
152		0.25		0.02	0.03	0.274	0.000		-0.033				237.74			-2.13	242.63
153	218	0.25	0.00	0.03	0.03	0.275	0.000	-0.005	-0.036	-5.18	-2.63	1461.96	246.74			-2.34	251.92
\boldsymbol{z}	= 66 ((Dy)															
	133	0.29		0.05	0.00	0.321			-0.013			1031.14					-8.83
	134	0.29			-0.01	0.322			-0.007			1046.17					-15.81
	135 136	0.29 0.28			-0.01 -0.01	0.323 0.311			-0.011 -0.010			1058.60 1072.87					-20.23 -26.45
	137	0.23			-0.01	0.311			-0.010			1072.37					-29.93
	138	0.27			-0.02	0.299		-0.056		-2.87		1097.77					-35.28
	139	0.25			-0.01	0.276			-0.006			1108.74					-38.24
	140	0.23	0.00	0.05	-0.01	0.253	0.000	-0.039	-0.002	-1.52	1.03	1121.64	-43.29			1.01	-43.09
	141	0.22			-0.01	0.241			-0.002			1132.22					-45.65
	142	0.21			-0.02	0.230		-0.044		-1.30		1144.66					-50.04
	143	0.19 -0.17			-0.01	0.208 -0.176			-0.000 -0.002			1154.82 1166.82		56 50	0.021		-52.19 -56.15
		-0.17 -0.17		0.04		-0.176 -0.176			-0.002 -0.002			1177.07			0.031 0.046		-58.38
		-0.15		0.03		-0.156						1189.04			0.027		-62.31
81	147	-0.07	0.00	0.01	0.00	-0.073	0.000	-0.010	0.001	-1.79	-1.05	1199.12	-64.27	-64.19	0.020	-1.06	-64.37
82	148	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-2.89	-2.02	1211.12	-68.20	-67.86	0.011	-2.02	-68.33
		-0.04				-0.042	0.000					1218.87			0.009		-68.05
	150		0.00	0.00	0.00	0.000	0.000	0.000				1228.43			0.005		-69.58
	151 152			-0.03 -0.02	-0.01 0.00	0.118 0.172	0.000	0.041 0.035		-0.55 -0.38		1235.43 1244.99			0.004 0.005		-68.54 -70.06
	153			-0.02	0.00	0.183	0.000	0.037		-0.40		1252.65			0.005		-69.68
	154			-0.02	0.00	0.105	0.000		-0.003			1262.03			0.003		-09.00 -71.01
	155			-0.02	0.01	0.227	0.000		-0.003			1269.30			0.012		-70.25
	156			-0.02	0.01	0.238	0.000		-0.002			1278.50			0.007		-71.39
	157			-0.03	0.01	0.249	0.000	0.061		-1.60		1285.52			0.007		-70.36
	158			-0.03	0.01	0.260	0.000	0.063		-1.92		1294.44			0.003		-71.22
	159 160			-0.03 -0.02	0.01	0.260 0.272	0.000 0.000	0.063	0.002 -0.001	-2.21		1301.13 1309.59			0.003 0.003		-69.87 -70.28
	161			-0.02 -0.02	0.01	0.272	0.000		-0.001 -0.010			1309.39			0.003		-70.28 -68.61
	162			-0.01	0.02	0.283	0.000		-0.013			1324.08			0.003		-68.65
97	163			-0.01	0.02	0.283	0.000		-0.013			1330.14			0.003	0.21	-66.67
	164	0.27		0.01	0.02	0.296	0.000		-0.019			1337.89			0.003		-66.34
	165	0.27		0.01	0.03	0.296	0.000					1343.61			0.003		-63.98
	166	0.27		0.02	0.03	0.297	0.000					1350.90			0.003	-0.34	
101	167	0.27	0.00	0.02	0.03	0.297	0.000	0.011	-0.032	-4.49	-0.79	1356.21	-59.93	-59.94	0.060	-0.68	-60.43

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 66 ((Dv)															
	168		0.00	0.03	0.03	0.298	0.000	-0.001	-0.036	-4.55	-0.79	1363.07	-58.72	-58.56	0.140	-0.64	-59.19
103	169		0.00	0.03	0.03	0.298	0.000	-0.001	-0.036	-4.83	-1.06	1367.98	-55.56	-55.60	0.301	-0.92	-56.04
	170		0.00	0.04	0.02	0.298						1374.34					-54.34
105			0.00	0.05	0.01	0.299						1378.76					-50.71
	172		0.00	0.05	0.01	0.287						1384.81					-48.66
	173 174		0.00 0.00	0.06	0.00	0.288 0.277						1389.01 1394.64					-44.79 -42.31
	174		0.00	0.06	0.00 -0.01	0.277						1394.64					-42.31 -37.98
	176		0.00		-0.01	0.277			-0.009			1403.56					-35.02
111	177	0.24	0.00	0.08	-0.02	0.266	0.000	-0.074	-0.001	-4.29	-0.55	1407.00	-30.01			-0.36	-30.32
112	178	0.24	0.00	0.08	-0.03	0.266	0.000	-0.075	0.009	-3.88	-0.12	1411.81	-26.75			0.13	-26.98
113			0.00		-0.03	0.255		-0.089		-4.20		1415.07					-22.09
	180		0.00		-0.04	0.243		-0.092	0.018	-3.81		1419.73					-18.54
115 116			0.00 0.00		-0.03 -0.04	0.220 0.220		-0.082 -0.083		-3.33 -3.18		1422.68 1427.23	-13.40 -9.89			0.19	-13.48 -9.83
					-0.04 -0.03			-0.083 -0.073				1427.23					-9.83 -4.55
	183 184	0.18	0.00		-0.03 -0.02	0.197 0.163		-0.073 -0.064		-2.82 -2.04		1429.95	-4.54 -0.54			0.12 0.36	-4.55 -0.57
		-0.18				-0.187		-0.021				1436.69	4.87			-0.12	4.78
120	186	-0.17	0.00	0.02	-0.01	-0.177	0.000	-0.011			-0.40	1441.02	8.61			-0.35	8.56
121	187	-0.15	0.00	0.02	-0.01	-0.156	0.000	-0.014	0.012	-2.49	-0.89	1443.56	14.14			-0.85	14.15
		-0.12		0.01	0.00	-0.125		-0.006		-2.26			18.10			-1.14	18.15
		-0.09		0.02		-0.094		-0.020		-3.10			23.32			-2.17	23.46
		-0.06 -0.01		0.02		-0.063 -0.011	0.000 0.000	-0.022 0.000	-0.008 0.000	-3.55 -4.43		1454.63 1457.02	27.29 32.97			-2.66 -3.54	27.51 33.23
	191	0.00		0.00	0.00	-0.011	0.000	0.000		-4.43 -4.98		1457.02	37.22			-3.34 -4.00	33.23 37.57
		-0.02			0.00		0.000	0.012				1461.32	44.81			-3.15	45.26
	194		0.00	0.00	0.00	0.000	0.000	0.012	0.000			1463.33	50.87			-2.05	51.41
	195			-0.01	0.00		-0.082	0.014	0.003	-2.64		1463.58	58.69			-1.13	59.40
	196			-0.02	0.00		-0.110	0.027				1465.56	64.79			-0.14	65.68
131	197			-0.02	0.01		-0.123	0.029		-2.30		1466.11	72.30			0.21	73.33
	198			-0.02	0.01		-0.137	0.030		-1.88		1468.03	78.46			0.99	79.64
133 134				-0.04 -0.04	0.00		-0.111 -0.111	0.056 0.056	0.011	-1.62 -0.95		1468.50 1470.34	86.05 92.29			1.19 1.80	87.36 93.74
135				-0.04	-0.00		0.000	0.030		-0.93 -1.32		1470.86					101.59
	202			-0.07		0.185	0.000	0.100		-1.51		1473.14					107.55
137	203	0.18	0.00	-0.07	0.00	0.195	0.000	0.101	0.019	-1.86	1.21	1473.63	113.21			1.58	115.19
138	204	0.19	0.00	-0.06	0.00	0.206	0.000	0.090	0.017	-1.55	1.28	1475.57	119.34				121.38
	205			-0.06	0.00	0.206	0.000	0.090		-1.93		1476.00	126.98				129.17
	206			-0.04	0.01	0.238	0.000	0.071		-1.75		1477.83	133.23				135.41
	207			-0.05	0.02	0.237	0.000		-0.003			1478.27	140.85				143.28
	208			-0.04	0.02	0.237	0.000		-0.007			1479.99	147.21 155.01			0.38	149.74 157.80
	209 210			-0.04 -0.03	0.03	0.248 0.249	0.000		-0.016 -0.019				161.63			-0.12 -0.18	164.57
145				-0.02	0.03	0.260	0.000		-0.021				169.73				172.81
	212			-0.02	0.04	0.260	0.000		-0.031				176.29			-0.77	179.75
147	213	0.24	0.00	-0.02	0.04	0.260	0.000	0.053	-0.031	-4.36	-1.68	1483.04	184.51			-1.31	188.15
	214			-0.01	0.04	0.261	0.000		-0.034				191.51			-1.31	195.36
	215		0.00		0.04	0.262	0.000		-0.037				200.00			-1.74	204.05
150 151	216 217		0.00 0.00	0.01 0.02	0.03	0.262 0.274	0.000 0.000		-0.030 -0.033				207.42 216.09			-1.68 -2.08	211.51 220.41
152153			0.00 0.00	0.03	0.03	0.275 0.275			-0.036 -0.036			1484.36	223.55 232.54				228.16 237.36
	220		0.00	0.03	0.03	0.275						1483.84					245.35
155			0.00	0.04	0.03	0.265						1482.72					254.77
7	= 67 ((Ho)															
	= 0 7 (136		0.00	0.07	-0.01	0.311	0.000	-0.052	-0.010	_4 27	-0.58	1056.41	-11 12			-0.70	-10.67
	137		0.00		-0.01	0.311						1070.82					-17.04
						-											

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 67 ((Ho)															
	138	0.27	0.00	0.07	-0.01	0.300	0.000	-0.054	-0.010	-3.94	-0.35	1082.89	-21.47			-0.44	-21.10
	139		0.00		-0.01				-0.010			1096.36					-26.52
73	140	0.26	0.00	0.08	-0.02	0.289	0.000	-0.070	-0.002	-3.43	0.21	1107.87	-30.30			0.13	-30.02
	141		0.00		-0.02			-0.062		-2.58		1120.88					-34.97
75	142	0.22	0.00	0.06	-0.01				-0.004	-2.19	0.48	1131.99	-38.28			0.44	-38.07
	143		0.00		-0.02			-0.056		-1.91		1144.41					-42.44
	144	0.20		0.05	-0.01				-0.001			1154.96					-44.98 40.02
		-0.18 -0.17		0.04 0.04					-0.002 -0.002			1167.04 1177.81					-49.02 -51.77
		-0.16		0.03					-0.004				-55.75	-55.84	0.028	-0.20	
		-0.08		0.00	0.00	-0.084	0.000	0.002	-0.000	-1.78	-1.01	1200.24	-58.10	-58.01	0.129	-1.01	-58.13
		-0.02		0.00		-0.021		0.000		-2.62			-61.97			-1.83	
83	150	-0.06	0.00	-0.01	0.00	-0.063	0.000	0.013	-0.001	-1.88	-1.11	1220.58	-62.31	-61.95	0.014	-1.12	-62.42
		-0.07				-0.073			-0.001				-63.84		0.012	-0.10	
85	152	0.13	0.00	-0.03	-0.01	0.140		0.043	0.016	-0.83	0.89	1237.87	-63.45	-63.61	0.014	0.90	-63.63
	153			-0.03	0.00	0.161		0.046		-0.52			-65.05		0.006		-65.28
	154			-0.01	0.01	0.194			-0.007				-65.21		0.008		-65.49
	155 156			-0.01 -0.01	0.01		0.000 0.000		-0.006 -0.006				-66.61 -66.31		0.018 0.045		-66.91 -66.65
	157			-0.01	0.01		0.000		-0.005				-67.50		0.043		-67.87
	158			-0.02	0.01		0.000		-0.002				-66.91		0.027		-67.31
	159			-0.02	0.01		0.000		-0.001				-67.76		0.004		-68.17
93	160	0.24	0.00	-0.02	0.01	0.261	0.000	0.051	-0.001	-1.96	1.11	1305.93	-66.93	-66.39	0.015		-67.38
94	161			-0.01	0.01		0.000	0.041	-0.004	-2.12	1.00	1314.48	-67.41	-67.20	0.003	1.02	-67.88
95	162	0.25	0.00	-0.01	0.01	0.272	0.000	0.041	-0.004	-2.48	0.68	1321.36	-66.22	-66.05	0.004	0.69	-66.72
	163		0.00	0.00	0.02		0.000		-0.016				-66.39		0.003		-66.88
	164		0.00	0.01	0.02		0.000		-0.020				-64.85		0.003		-65.37
	165 166	0.26 0.27		0.01 0.02	0.02		0.000 0.000		-0.020 -0.023				-64.71 -62.83		0.003	-0.09 -0.46	
100		0.27		0.02	0.02	0.290			-0.023 -0.032				-62.83 -62.17		0.003	-0.40 -0.54	
101			0.00	0.03	0.03				-0.036				-59.92		0.030	-0.88	
102		0.27		0.03	0.03				-0.030 -0.039				-58.83		0.030	-0.88 -0.90	
103		0.27	0.00	0.04	0.02				-0.029							-1.23	
104	171	0.27	0.00	0.05	0.02				-0.032					-54.53	0.600	-1.11	-55.08
105	172	0.26	0.00	0.05	0.01	0.287	0.000	-0.030	-0.022	-5.04	-1.46	1387.39	-51.54			-1.39	-52.09
106		0.26		0.06	0.01				-0.025								-50.05
107		0.26		0.06	0.00				-0.016								-46.70
108 109		0.25 0.25		0.07	0.00 -0.01				-0.018 -0.009							-1.21	-44.31 -40.43
110		0.25			-0.01				-0.009 -0.011							-0.86	
111		0.24			-0.02				-0.001								-33.34
111		0.24			-0.02 -0.03			-0.074 -0.087				1417.24					-30.05
113		0.23			-0.03			-0.089				1425.81				-0.49	
114	181	0.22	0.00	0.09	-0.04	0.243	0.000	-0.092	0.018	-4.32	-0.46	1430.53	-22.04			-0.12	-22.15
115	182	0.21	0.00	0.09	-0.04	0.232	0.000	-0.094	0.019	-4.35	-0.56	1433.92	-17.35			-0.22	-17.43
116	183	0.20	0.00	0.08	-0.04	0.220	0.000	-0.083	0.022	-3.61	-0.33	1438.39	-13.76			0.00	-13.81
117		0.18			-0.03			-0.073				1441.52	-8.82			-0.22	-8.93
118		0.15			-0.02			-0.064				1445.58	-4.80			0.09	-4.93
		-0.19 -0.18				-0.197 -0.187						1448.70 1453.08	0.15 3.84			-0.37 -0.61	-0.01 3.71
		-0.15 -0.13		0.02		-0.156 -0.136						1455.99 1460.07	9.00 12.99			-1.06 -1.27	8.90 12.94
		-0.13 -0.09		0.02		-0.130 -0.094						1463.37	17.76			-1.27 -2.34	12.94 17.77
		-0.07		0.02		-0.073						1467.48	21.72			-2.79	21.82
		-0.01		0.00		-0.011		0.000				1470.20	27.08			-3.56	27.22
126	193	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.95	-3.99	1474.02	31.32			-3.99	31.54
		-0.02		0.00		-0.021		0.000				1474.95	38.47			-3.16	38.78

N	A	$arepsilon_2$	ϵ_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 67 ((Ho)															
		-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-2.86	-2.06	1476.99	44.49			-2.06	44.89
	196			-0.01	0.00		-0.068	0.014	0.002	-2.38		1477.58	51.98			-1.08	52.51
	197			-0.02	0.00		-0.082	0.027	0.004	-1.72		1479.54	58.10			-0.08	58.77
	198 199			-0.02 -0.04	0.01 -0.01		-0.123 -0.070	0.029 0.055	-0.002	-2.13 -1.09		1480.46 1482.52	65.24 71.26			0.37 1.02	66.09 72.24
	200			-0.04	0.00		-0.097	0.056		-1.30		1483.40	78.45			1.22	79.53
134				-0.04	0.00	0.120		0.050	0.010	-0.67		1485.27	84.65			1.84	85.88
135	202			-0.07	-0.01	0.163	0.000	0.097	0.026	-1.39	1.50	1486.26	91.73			1.89	93.25
	203			-0.06	-0.01	0.184	0.000	0.087	0.026	-1.11		1488.47	97.59			1.86	99.17
	204			-0.07	0.00	0.184	0.000	0.100		-1.73		1489.44	104.69			1.56	106.42
138	205 206			-0.06 -0.06	0.00	0.194 0.205	0.000	0.089	0.016 0.007	-1.39 -1.86		1491.34 1492.22	110.86 118.06			1.63 1.18	112.66 119.96
	207			-0.06 -0.05	0.01	0.203	0.000	0.080	0.007	-1.69		1492.22	124.33			1.16	126.32
	208			-0.04	0.02	0.237	0.000		-0.007			1494.79	131.63			0.61	133.73
142	209	0.22	0.00	-0.04	0.02	0.237	0.000	0.072	-0.007	-2.38	0.32	1496.57	137.92			0.48	140.19
	210			-0.04	0.03	0.237	0.000			-2.97		1497.19	145.37			0.01	147.88
144				-0.03	0.03	0.249	0.000			-2.98		1498.68	151.95			-0.07	154.60
	212213			-0.02 -0.01	0.03	0.260 0.261	0.000		-0.021 -0.024			1499.04 1500.39	159.66 166.38			-0.58 -0.68	162.44 169.34
	214			-0.01	0.03	0.261	0.000		-0.024			1500.64	174.20			-0.03 -1.23	177.33
	215	0.24		0.00	0.03	0.261	0.000		-0.027			1501.78	181.14			-1.28	184.48
	216	0.24		0.00	0.03	0.261	0.000			-4.47		1501.76	189.23			-1.74	192.75
	217	0.24		0.01	0.03	0.262	0.000	0.016	-0.030	-4.43		1502.68	196.38			-1.74	200.12
	218	0.24		0.02	0.03	0.263	0.000		-0.033	-4.90		1502.50	204.63			-2.17	208.61
	219	0.25		0.03	0.03	0.275	0.000					1503.16	212.04			-2.06	216.28
153 154	220	0.25 0.24		0.04	0.03	0.276		-0.017 -0.020				1502.69	220.59 228.28			-2.33 -2.14	225.10 233.04
155		0.24		0.04	0.03	0.265 0.265				-5.01 -5.21		1503.06 1502.18	237.23			-2.14 -2.35	242.09
156		0.24		0.05	0.02	0.265		-0.033		-4.99		1502.39	245.09			-2.17	250.19
157	224	0.24	0.00	0.06	0.02	0.266	0.000	-0.045	-0.034	-5.46	-2.79	1501.61	253.94			-2.43	259.37
\boldsymbol{Z}	= 68 ((Er)															
	138	0.28	0.00	0.09	-0.02	0.313	0.000	-0.077	-0.007	-4.96	-0.83	1070.22	-9.58			-0.91	-9.03
	139	0.28			-0.03	0.312		-0.079				1082.39					-13.19
	140	0.27			-0.02	0.301						1096.45					-19.20
	141 142	0.25	0.00		-0.02 -0.02	0.278 0.266			-0.002 -0.001			1108.03 1121.53					-22.77 -28.22
	143	0.23			-0.02	0.254		-0.064		-2.73		1132.83					-31.52
	144	0.23			-0.02	0.234		-0.068		-2.75 -2.36		1132.83					-36.58
	145	0.20			-0.02	0.219	0.000	-0.057	0.007	-1.93		1156.50					-39.13
		-0.18		0.03		-0.187			-0.004			1169.29					-43.89
		-0.18		0.04		-0.187						1180.13					-46.72
		-0.14		0.03		-0.146		-0.026				1192.67		50.74	0.020		-51.22
	149	-0.09 0.01		0.01	0.00	-0.094 0.011	0.000	-0.008 0.000				1203.07 1215.53			0.028 0.017	-1.32 -2.11	
		-0.06				-0.063	0.000					1213.33			0.017	-2.11 -1.41	
		-0.08			0.00	-0.084	0.000					1234.18			0.011		-60.63
85	153	0.12	0.00	-0.03	-0.01	0.129	0.000	0.042	0.015	-0.99	0.64	1241.90	-60.19	-60.49	0.009	0.65	-60.31
	154			-0.03	0.00	0.150	0.000	0.045		-0.57		1252.03			0.005		-62.41
	155			-0.02	0.01	0.172	0.000		-0.005			1260.01			0.007		-62.36
	156 157			-0.01 -0.01	0.01	0.205 0.216	0.000 0.000		-0.006 -0.006			1270.16 1277.91			0.024 0.028		-64.47 -64.20
	158 159			-0.01 -0.01	0.01	0.227 0.238	0.000		-0.006 -0.005			1287.58 1295.10			0.025 0.004		-65.83 -65.31
	160			-0.01	0.01	0.250	0.000		-0.005			1304.52			0.024		-66.68
	161			-0.01	0.01	0.261	0.000		-0.004			1311.80			0.009		-65.92
94	162		0.00	0.00	0.01	0.273	0.000	0.028	-0.007	-1.65	1.30	1320.88	-66.52	-66.34	0.003	1.33	-66.95
95	163	0.25	0.00	0.00	0.01	0.273	0.000	0.028	-0.007	-2.03	0.97	1327.84	-65.42	-65.17	0.005	0.99	-65.88

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 68 (Er)															
	164	0.26	0.00	0.01	0.01	0.284	0.000	0.018	-0.010	-2.36	0.77	1336.59	-66.09	-65.95	0.003	0.80	-66.56
	165	0.26		0.01	0.01	0.284	0.000		-0.010			1343.18			0.003		-65.12
	166 167	0.26 0.27		0.02	0.02	0.285 0.297	0.000		-0.023 -0.026			1351.68 1357.95			0.003		-65.53 -63.75
	168	0.27		0.03	0.02	0.297			-0.026 -0.026			1365.87			0.003		-63.73 -63.59
	169	0.27		0.04	0.02	0.298			-0.029						0.003		-61.46
	170	0.27		0.04	0.02	0.298			-0.029						0.003		-60.88
	171	0.27		0.05	0.02	0.299			-0.032						0.003		-58.36
	172	0.27		0.06	0.01	0.300			-0.026					-56.49	0.005		-57.28
	173	0.26		0.06	0.01	0.289			-0.025								-54.34
	174 175	0.26		0.06 0.07	0.00	0.288 0.289			-0.016 -0.019								-52.93 -49.71
	176	0.25		0.07	0.00	0.278			-0.018								-47.82
109	177	0.25		0.08	-0.01	0.278			-0.011							-1.53	-44.07
110	178	0.25	0.00	0.08	-0.02	0.278	0.000	-0.072	-0.002	-5.25	-1.32	1424.75	-41.25			-1.15	-41.67
	179	0.24			-0.02	0.267			-0.004								-37.55
	180 181	0.24 0.23			-0.03 -0.03	0.267 0.255		-0.087 -0.089				1434.13 1437.84					-34.78 -30.41
	182	0.23			-0.03 -0.04	0.233		-0.089 -0.092				1437.84					-30.41 -27.41
	183	0.21			-0.04	0.232		-0.094				1446.46					-22.74
116	184	0.20	0.00	0.09	-0.04	0.221	0.000	-0.095	0.020	-4.35	-0.73	1451.40	-19.48			-0.35	-19.54
	185	0.18	0.00		-0.03	0.198		-0.085				1454.54				-0.54	-14.68
	186	0.15			-0.03	0.164		-0.077				1459.13					-11.16
		-0.19 -0.18				-0.197 -0.187		-0.030 -0.021				1462.21 1467.04	-6.07 -2.83			-0.73 -0.98	-6.30 -3.03
		-0.16 -0.15						-0.021 -0.014				1469.96					
		-0.13		0.02		-0.156 -0.136		-0.014 -0.016				1474.48	2.32 5.88			-1.41 -1.60	2.14 5.73
		-0.09		0.02		-0.094		-0.020	-0.007			1477.81	10.61			-2.66	10.54
		-0.07		0.03	0.01	-0.073	0.000	-0.033				1482.32	14.17			-3.07	14.19
125	193	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.79	-3.89	1485.11	19.45			-3.89	19.48
	194	0.00		0.00	0.00	0.000	0.000	0.000		-5.22		1489.29	23.35			-4.25	23.45
	195 196	-0.02 0.00		-0.01 0.00	0.00	-0.021 0.000	0.000 0.000	0.012		-4.27 -3.10		1490.21 1492.68	30.50 36.10			-3.38 -2.28	30.68 36.36
		0.03			0.00		-0.054	0.013				1493.21	43.64			-1.23	44.01
130	198	0.06	0.05	-0.02	0.00		-0.069	0.027	0.003	-1.56	-0.22	1495.50	49.42			-0.15	49.92
131	199	0.07	0.08	-0.02	0.00	0.077	-0.110	0.028	0.007	-1.88	0.20	1496.41	56.58			0.34	57.25
	200			-0.04	-0.01		-0.056	0.054		-0.90		1498.85	62.21			1.03	63.02
133 134				-0.04 -0.04	0.00		-0.083 -0.083	0.055 0.055		-1.02 -0.37		1499.73 1502.01	69.41 75.20			1.25 1.86	70.31 76.22
	203			-0.04 -0.06		0.119	0.000	0.033		-0.37 -0.86		1502.01	82.37			1.98	83.63
	204			-0.06		0.173	0.000	0.085		-0.80		1505.56	87.78			1.99	89.18
	205			-0.06		0.173	0.000	0.087		-1.25		1506.49	94.93			1.75	96.44
138	206	0.18	0.00	-0.06	0.00	0.194	0.000	0.089		-1.15	1.58	1508.79	100.70			1.85	102.30
	207			-0.05	0.00	0.205	0.000	0.078		-1.29		1509.59	107.97			1.45	109.62
	208			-0.05	0.01	0.216	0.000	0.080		-1.37		1511.80	113.83			1.46	115.61
	209			-0.05 -0.04	0.01	0.216	0.000	0.080		-1.80		1512.56	121.15			0.99	123.06
	210 211			-0.04 -0.03	0.02	0.237 0.238	0.000 0.000		-0.007 -0.009			1514.71 1515.23	127.07 134.62			0.84 0.36	129.11 136.76
	212			-0.03	0.02	0.237	0.000		-0.009			1517.21	140.71			0.33	143.12
	213			-0.02	0.03	0.249	0.000		-0.022				148.39				150.93
146	214	0.23	0.00	-0.02	0.03	0.249	0.000	0.050	-0.022	-3.03	-0.44	1519.30	154.76				157.48
	215			-0.01	0.03	0.261	0.000		-0.024				162.61			-0.77	165.47
	216	0.24		0.00	0.03	0.261	0.000		-0.027				169.08			-0.90	172.14
	217 218	0.24 0.24		0.01 0.02	0.03	0.262 0.263	0.000 0.000		-0.030 -0.033				177.10 183.81			-1.39 -1.44	180.36 187.30
	219	0.24		0.02	0.03	0.264			-0.036				192.04				195.76
	220	0.24		0.03	0.03	0.264			-0.036 -0.036				192.04				203.01
		· ·	50		0.05	3.201	3.500	3.000	3.350		2.12					1.00	

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 68 (Er)															
153		0.24	0.00	0.04	0.03	0.265	0.000	-0.020	-0.038	-5.04	-2.48	1522.99	207.58			-2.11	211.77
154	222	0.24	0.00	0.04	0.03	0.265	0.000	-0.020	-0.038	-4.83	-2.29	1523.72	214.92			-1.91	219.34
155		0.24		0.05	0.02				-0.031				223.77			-2.19	228.29
156 157		0.24	0.00	0.06	0.02				-0.034 -0.024				231.17 240.21			-2.02 -2.33	236.02 245.12
158		0.24		0.07	0.01				-0.027				247.70			-2.21	252.96
159		0.24		0.07	0.00				-0.027 -0.017				256.75			-2.59	262.16
\boldsymbol{Z}	= 69 ((Tm)															
	141		0.00		-0.03			-0.093				1094.10					-9.49
	142	0.25 0.24			-0.03			-0.085 -0.074	0.005 -0.001			1106.21 1119.82					-13.58
	143 144	0.24			-0.02 -0.02			-0.074 -0.076	-0.001 -0.000			1119.82					-19.15 -22.94
	145	0.21			-0.02			-0.068				1144.80					-28.08
77	146	0.20	0.00	0.07	-0.02	0.220	0.000	-0.069	0.005	-2.67	-0.00	1155.85	-31.42			-0.05	-31.11
		-0.18		0.04		-0.187			0.007			1168.64					-35.87
		-0.17		0.04		-0.177			0.007			1179.90					-39.11
		-0.16 -0.12		0.03		-0.166 -0.125						1192.55 1203.28					-43.74 -46.44
	151	0.02		0.00	0.00		0.000	0.000	0.000			1215.84		-50.78	0.020		-50.97
83	152	-0.07				-0.073		0.014	-0.001	-2.31	-1.54	1224.91	-52.05	-51.77	0.074	-1.55	-52.02
		-0.10				-0.104		0.028		-1.57		1235.14			0.018		-54.22
	154 155			-0.02 -0.02	0.00		0.000 0.000	0.030 0.033	0.003 0.004	-1.03 -0.61		1243.48 1253.67			0.014 0.013		-54.55 -56.70
	156			-0.02	0.01		0.000			-0.57		1262.19			0.016		-57.20
	157			-0.02	0.01		0.000		-0.003	-0.40		1272.43			0.028		-59.41
	158			-0.01	0.01		0.000	0.028	-0.006	-0.39	1.60	1280.58	-59.29	-58.70	0.025		-59.53
	159		0.00	0.00	0.01		0.000		-0.008	-0.49		1290.30			0.028		-61.22
	160		0.00	0.00	0.01		0.000		-0.008	-0.67		1298.27			0.034		-61.16
	161 162	0.23	0.00	0.00	0.01		0.000 0.000	0.024	-0.008 0.003	-0.89 -1.25		1307.73 1315.45			0.028 0.026		-62.57 -62.26
	163		0.00	0.01	0.01		0.000		-0.010	-1.41		1324.64			0.006		-63.40
	164		0.00	0.01	0.01		0.000		-0.010			1332.10			0.028		-62.83
	165	0.25		0.02	0.01		0.000			-2.20		1340.94			0.003		-63.61
	166	0.26		0.02	0.01		0.000		-0.013			1348.07			0.012		-62.70
	167 168	0.26 0.26		0.03	0.01 0.02				-0.016			1356.59 1363.39			0.003 0.003		-63.16 -61.90
100		0.27		0.03	0.02							1371.44			0.002		-61.86
101	170	0.27	0.00	0.04	0.02	0.298	0.000	-0.014	-0.029	-4.65	-0.91	1377.88	-59.74	-59.80	0.002	-0.86	-60.27
102		0.27	0.00	0.05	0.02							1385.50			0.003	-0.96	-59.79
103		0.27		0.05	0.02							1391.53			0.006		-57.77
104	174	0.26 0.26		0.06	0.01							1398.66 1404.30			0.005 0.045		-56.83 -54.42
106		0.26		0.07	0.00							1411.11			0.050		-53.14
107	176	0.25	0.00	0.07	0.00	0.278	0.000	-0.057	-0.018	-5.95	-2.07	1416.44	-49.87	-49.37	0.100	-1.98	-50.40
108		0.25			-0.01							1422.80				-1.86	-48.65
109		0.25			-0.01							1427.61					-45.39
110 111		0.25 0.24			-0.02 -0.02							1433.44 1437.80					-43.09 -39.37
111		0.24			-0.02 -0.03			-0.099				1443.34					-36.74
113		0.24			-0.03 -0.04			-0.099 -0.102				1447.58					-32.84
114	183	0.23			-0.04	0.255	0.000	-0.102				1452.75					-29.88
	184	0.21			-0.04			-0.094				1456.58					-25.66
116		0.20			-0.04			-0.095				1461.54					-22.48
117 118		0.18 0.15			-0.03 -0.02			-0.085 -0.064				1465.11 1469.62					-18.04 -14.54
		-0.19				-0.197						1473.19					-14.34 -10.08
		-0.18				-0.187						1478.12					-6.86

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 69 ((Tm)															
121	190	-0.15	0.00	0.02	-0.01	-0.156	0.000	-0.014	0.012	-3.40	-1.76	1481.40	-1.83			-1.73	-2.10
		-0.12		0.02		-0.125		-0.017	0.003	-3.13		1485.98	1.66			-1.95	1.43
		-0.11		0.02		-0.115		-0.018	0.002	-3.98		1489.65	6.06			-2.92	5.88
		-0.07 -0.01		0.03		-0.073 -0.011	0.000 0.000	-0.033 0.000	-0.007 0.000	-4.36 -4.99		1494.23 1497.39	9.55 14.46			-3.36 -4.11	9.46 14.39
126		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.48		1501.66	18.27			-4.52	18.26
	195	-0.00		0.00	0.00	-0.021	0.000	0.000	0.000	-3.46 -4.44		1502.94	25.05			-3.60	25.12
128		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-3.28		1505.43	30.64			-2.47	30.78
129		0.02	0.02	0.00	0.00	0.021	-0.027	0.000	0.000	-2.26		1506.48	37.65			-1.55	37.88
130	199	0.06	0.05	-0.02	0.00	0.065	-0.069	0.027	0.003	-1.69		1508.63	43.58			-0.27	43.94
131					-0.01		-0.028	0.053				1510.00	50.28			0.17	50.80
132 133				-0.04 -0.04	-0.01 0.00		-0.042 -0.069	0.054 0.055	0.017	-0.93 -0.91		1512.44 1513.68	55.91 62.74			0.87 1.14	56.54 63.46
134				-0.04 -0.05	0.00		-0.009 -0.028	0.055				1515.08	68.52			1.78	69.37
135				-0.06		0.152	0.000	0.083		-0.82		1517.28	75.28			1.88	76.34
136	205	0.16	0.00	-0.06	-0.01	0.173	0.000	0.085	0.025	-0.88		1519.72	80.91			2.14	82.10
137	206	0.17	0.00	-0.06	0.00	0.184	0.000	0.087	0.015	-1.16		1521.21	87.50			1.68	88.75
138				-0.05	0.00	0.194	0.000	0.076		-0.83		1523.51	93.27			1.79	94.58
139				-0.05	0.00	0.194	0.000	0.076		-1.18		1524.71	100.14			1.46	101.57
140				-0.05	0.01	0.205	0.000	0.078				1527.03	105.90			1.40	107.45
141				-0.04 -0.03	0.01	0.216	0.000	0.067	0.002 -0.009	-1.54		1528.03 1530.20	112.96 118.87			1.01	114.59 120.64
142 143				-0.03	0.02	0.238 0.238	0.000 0.000	0.059	-0.009 -0.009	-1.74 -2.27		1530.20	125.95			0.90 0.39	120.04
144				-0.03	0.02	0.237	0.000		-0.020	-2.42		1533.19	132.02			0.34	134.18
145				-0.02	0.03	0.238	0.000		-0.022	-2.77		1533.93	139.35			-0.14	141.63
146	215	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-2.88	-0.39	1535.66	145.69			-0.21	148.13
147				-0.01	0.03	0.250	0.000			-3.41		1536.26	153.16			-0.72	155.75
148		0.23		0.00	0.03	0.250	0.000		-0.027			1537.84	159.65			-0.81	162.43
149 150		0.23 0.24		0.01 0.02	0.03	0.251 0.263	0.000 0.000		-0.030 -0.033			1538.31 1539.71	167.26 173.93			-1.34 -1.42	170.22 177.11
151		0.24		0.02	0.03	0.264	0.000					1539.98	181.72			-1.91	185.13
152		0.24		0.03	0.03	0.265	0.000	-0.008 -0.020				1541.12	188.65			-1.91 -1.87	192.33
153		0.24		0.04	0.03	0.265			-0.038				196.83			-2.19	200.69
154			0.00	0.05	0.02	0.265			-0.031				204.21				208.18
155		0.24	0.00	0.06	0.02	0.266	0.000	-0.045	-0.034	-5.48	-2.67	1541.48	212.51			-2.33	216.76
156		0.24		0.06	0.01	0.266						1541.98					224.42
157 158		0.24 0.23		0.07 0.07	0.01	0.267 0.255						1541.64 1542.18					233.14 240.92
159		0.23		0.07	0.00	0.256			-0.020 -0.019				244.56				249.69
160		0.23		0.08	0.00	0.256			-0.019				252.17				257.54
161	230	0.23	0.00	0.09	-0.01	0.256	0.000	-0.086	-0.012	-7.02	-3.86	1541.71	260.71			-3.43	266.40
7.	- 70 ((Vb)															
	= 70 (143	0.26	0.00	0.11	-0.04	0.291	0.000	-0.109	0.008	_5 53	_0.89	1105.29	_5.86			_0.98	-5.24
	144	0.24			-0.04	0.267		-0.103 -0.087				1119.41					-3.24 -11.32
	145	0.23		0.09	-0.03	0.255		-0.089				1131.36					-15.27
	146	0.21			-0.03	0.232		-0.081				1145.05					-20.91
77	147	0.20	0.00	0.08	-0.03	0.220	0.000	-0.082	0.012	-3.17	-0.25	1156.29	-24.57			-0.29	-24.15
		-0.18		0.04		-0.187		-0.032				1169.73					-29.56
		-0.16		0.04		-0.167		-0.035				1181.16					-32.98
		-0.16 -0.12		0.04 0.01		-0.167 -0.125		-0.035 -0.006				1194.38 1205.17		-41.54	0.300	-1.38 -1.83	-38.18 -40.94
	152	0.00		0.00	0.00		0.000	0.000				1218.39				-2.76	
		-0.05				-0.052	0.000					1227.45		-			-47.18
						-0.104	0.000	0.028				1238.19		-49.93	0.017	-0.93	
	155	0.11	0.00	-0.02	0.00	0.118	0.000	0.029		-1.29	0.06	1246.55	-50.26	-50.50	0.017		-50.24
	156			-0.03	0.00	0.139	0.000	0.044		-0.95		1257.18			0.011		-52.84
87	157	0.15	0.00	-0.02	0.00	0.161	0.000	0.034	0.004	-0.62	1.11	1265.70	-53.27	-53.44	0.010	1.11	-53.34

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 70 (Yb)															
	158		0.00	-0.01	0.01	0.183	0.000	0.025	-0.007	-0.34	1.32	1276.33	-55.82	-56.01	0.008	1.33	-55.94
	159		0.00	0.00	0.01	0.194	0.000		-0.009			1284.55			0.018		-56.14
	160 161	0.19	0.00	0.00 0.00	0.01 0.01	0.206 0.217	0.000 0.000		-0.009 -0.009			1294.70 1302.64			0.017 0.016		-58.26 -58.17
	162	0.20		0.00	0.01	0.217	0.000		-0.009 -0.008	-0.17 -0.43		1302.04			0.016		-56.17 -60.05
93	163		0.00	0.00	0.00	0.250	0.000	0.023		-0.73		1320.29			0.016		-59.75
	164		0.00	0.01	0.00	0.262	0.000		-0.001			1329.93			0.016		-61.35
	165	0.24		0.01	0.01	0.262	0.000		-0.010			1337.43			0.028		-60.81
	166 167	0.25 0.25		0.02	0.01	0.274 0.274	0.000 0.000		-0.013 -0.013			1346.79 1353.97			0.008 0.005		-62.12 -61.27
	168		0.00	0.02	0.01	0.286			-0.016			1362.99			0.003		-62.22
	169		0.00	0.03	0.01	0.286			-0.016			1369.82			0.004		-61.02
	170		0.00	0.04	0.01	0.287			-0.019						0.002		-61.49
101		0.27		0.05	0.01	0.299			-0.023						0.002		-59.96
102	172	0.27		0.06	0.01	0.300 0.300			-0.026 -0.026							-0.62 -1.05	
	174		0.00 0.00	0.06	0.01	0.300			-0.026 -0.025						0.002 0.002		-58.11 -57.66
	175		0.00	0.07	0.00	0.289			-0.019							-1.50	
106		0.26			-0.01	0.289			-0.012							-1.54	
	177	0.25			-0.01	0.278			-0.011							-1.96	
108	178 179	0.25	0.00		-0.01 -0.02	0.278 0.278			-0.011 -0.004					-49.70	0.010		-50.86 -47.72
110			0.00		-0.02	0.278			-0.004								-45.90
111		0.24			-0.03	0.268		-0.099	0.003			1448.14					-42.37
112	182	0.24		0.10	-0.04	0.267	0.000	-0.101				1454.12					-40.19
113		0.23			-0.04	0.255		-0.102				1458.42					-36.41
114 115		0.23 0.21			-0.05 -0.04	0.255 0.233		-0.104 -0.106				1464.11 1468.03					-33.92 -29.81
116			0.00		-0.04	0.221		-0.095				1473.39					-27.08
117	187	0.18	0.00	0.08	-0.03	0.198	0.000	-0.085	0.014	-4.71	-1.58	1477.01	-22.44			-1.34	-22.70
118			0.00		-0.03	0.164		-0.077				1482.14					-19.73
		-0.19 -0.18				-0.197 -0.187		-0.030 -0.020	0.017			1485.61 1491.00					-15.26 -12.51
		-0.15				-0.156		-0.025				1494.37					-7.82
122	192	-0.12	0.00	0.02	0.00	-0.125	0.000	-0.017	0.003	-3.60	-2.43	1499.40	-4.47			-2.41	-4.77
		-0.09		0.02		-0.094		-0.020				1503.19	-0.19			-3.46	-0.44
	194 195	-0.07 0.00		0.03	0.01	-0.073 0.000	0.000	-0.033 0.000				1508.15 1511.32	2.92 7.82			-3.84 -4.57	2.76 7.66
	196	0.00		0.00	0.00	0.000	0.000	0.000				1516.01	11.20			-4.98	11.10
127	197	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-4.93	-4.05	1517.33	17.96			-4.05	17.92
128		0.01		0.00	0.00	0.011	0.000	0.000				1520.19	23.16			-2.88	23.20
129 130			0.00	$0.00 \\ -0.02$	0.00	0.021 0.064	0.000 -0.027	0.000 0.026				1521.26 1523.74	30.17 35.76			-1.94 -0.59	30.28 35.99
131				-0.02 -0.04		0.004	0.000	0.052				1525.74	42.56			-0.09 -0.02	42.94
	202			-0.04			-0.028	0.053		-0.88		1527.82	47.82			0.73	48.30
133	203	0.11	0.05	-0.04	0.00	0.119	-0.069	0.055	0.008	-1.02	0.92	1529.06	54.66			1.05	55.23
134				-0.04	0.00		-0.056	0.054		-0.23		1531.79	60.00			1.62	60.66
	205 206			-0.05 -0.06	0.00	0.151	-0.028 0.000	0.070 0.084		-0.43 -0.65		1532.92 1535.78	66.93 72.15			1.85 2.21	67.73 73.18
137				-0.06		0.102	0.000	0.085		-0.03 -1.00		1535.78	78.72			1.83	79.86
	208			-0.05	0.00	0.183	0.000	0.074		-0.51		1539.91	84.16			1.95	85.29
139	209			-0.05	0.00	0.194	0.000	0.076		-0.98	1.47	1541.11	91.03			1.65	92.28
	210			-0.04	0.01	0.205	0.000	0.065		-0.73		1543.72	96.49			1.63	97.80
141 142	211			-0.04 -0.04	0.01	0.205 0.215	0.000 0.000	0.065	-0.001 -0.008	-1.12 -1.32		1544.78 1547.29	103.50 109.06			1.27 1.25	104.94 110.68
	213			-0.03	0.02	0.238	0.000		-0.009			1548.28	116.15				117.85
	214			-0.02	0.02	0.238	0.000		-0.012			1550.56					123.76

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 70 (Yb)															
145 146 147	215 216 217	0.22 0.23 0.23	0.00	-0.02 -0.01 -0.01	0.03 0.03 0.03	0.238 0.250 0.250	0.000	0.038 0.038	-0.022 -0.025 -0.025	$-2.50 \\ -3.04$	-0.03 -0.53	1551.42 1553.51 1554.14	129.15 135.13 142.57				131.21 137.34 144.93
148 149			0.00	0.00 0.01	0.03 0.03	0.250 0.251	0.000		-0.027 -0.030			1556.11 1556.57	148.67 156.28			-0.46 -0.96	151.21 158.99
150 151 152 153 154	222 223	0.24 0.24 0.24	0.00 0.00 0.00 0.00 0.00	0.02 0.03 0.04 0.05 0.05	0.03 0.02 0.02 0.02 0.02	0.264 0.265	0.000 0.000 0.000	-0.009 -0.021 -0.033	-0.033 -0.026 -0.029 -0.031 -0.031	-4.29 -4.38 -4.86	-1.71 -1.76 -2.13	1558.54 1560.06	162.54 170.46 177.01 185.12 191.99			-1.07 -1.58 -1.56 -1.87 -1.75	165.47 173.44 180.23 188.59 195.67
155 156 157 158 159	225 226 227 228	0.24 0.23 0.23 0.23	0.00	0.06 0.06 0.07 0.07 0.08	0.01 0.01 0.01 0.00 0.00	0.266 0.254 0.255 0.255	0.000 0.000 0.000 0.000	-0.046 -0.048 -0.060 -0.061	$-0.024 \\ -0.024 \\ -0.026 \\ -0.017 \\ -0.019$	-5.07 -4.82 -5.48 -5.32	-2.27 -2.14 -2.62 -2.49	1560.88 1561.88 1561.61 1562.44	200.40 207.48 215.81 223.05 231.38			-2.06 -1.90 -2.30 -2.24 -2.79	204.21 211.52 220.14 227.52 236.17
160 161	230	0.23		0.09	-0.01 -0.01	0.256	0.000	-0.086	-0.012 -0.011	-6.50	-3.31	1563.14	238.50 247.10			-2.86 -3.39	243.60 252.43
162 163 164		0.22	0.00 0.00 0.00	0.10	-0.02 -0.02 -0.03	0.245	0.000		-0.002 -0.004 0.006	-7.43	-4.16		254.46 263.51 271.40			-3.44 -3.55 -3.16	260.06 269.48 277.71
\boldsymbol{z}	= 71 (Lu)															
76 77 78	146 147 148 149	$0.19 \\ -0.18$	0.00 0.00 0.00	0.09 0.08 0.05	0.00	0.232 0.209 -0.187	0.000 0.000 0.000		0.009 0.013 0.010	-4.23 -3.64 -2.84	-0.88 -0.82 -0.92	1128.98 1142.83 1154.69 1168.21	-15.68 -21.13			-0.93 -0.87 -0.95	-5.49 -11.31 -15.16 -20.66
80	151	-0.17 -0.16 -0.10	0.00	0.05 0.04 0.01	0.00	-0.176 -0.167 -0.105	0.000		0.000 0.007 0.001	-3.68	-1.82	1180.16 1193.39 1204.80	-30.16			-1.84	-24.60 -29.80 -33.19
82 83	153 154	$-0.02 \\ -0.08$	0.00	0.00	0.00	-0.021 -0.084	0.000	0.000 0.014	0.000 -0.001	-3.87 -3.21	-3.14 -2.40	1217.94 1227.57	-38.58 -40.14		0.209	-3.14 -2.41	-38.30 -39.93
85	155156157	0.11	0.00	-0.01 -0.02 -0.02	0.00 0.00 0.00	0.096 0.118 0.139	0.000	0.015 0.029 0.032	0.001 0.003 0.004		-0.36	1238.20 1247.30 1257.96	-43.72	-43.75	0.020 0.074 0.019	-0.37	-42.54 -43.61 -46.26
88	158 159 160	0.16		-0.01 -0.01 0.00	0.00 0.01 0.01	0.161 0.172 0.183	0.000		0.002 -0.007 -0.009		1.14	1267.02 1277.51 1286.38	-49.71	-49.72	0.015 0.038 0.057	1.14	-47.31 -49.76 -50.62
90	161 162	0.19	0.00	0.00	0.01 0.01	0.206 0.206	0.000	0.016	-0.009 -0.009	-0.38	1.52	1296.57 1305.00	-52.63	-52.56	0.028 0.075	1.51 1.62	-52.77 -53.18
93	163 164 165	0.22	0.00 0.00 0.00	0.01 0.01 0.01	0.01 0.00 0.01	0.228 0.239 0.239	0.000	0.009	-0.011 -0.001 -0.011	-0.60	1.68	1314.90 1323.09 1332.72	-54.94	-54.64	0.028 0.028 0.027	1.67	-55.05 -55.22 -56.81
95	166 167	0.23	0.00	0.01 0.02	0.00 0.01	0.250 0.262	0.000	0.011	-0.001 -0.013	-1.09	1.42	1340.66 1350.06	-56.37	-56.02	0.030 0.032	1.41	-56.72 -58.06
98	168 169 170	0.25	0.00 0.00 0.00	0.02 0.04 0.04	0.01 0.00 0.00		0.000	-0.022	-0.013 -0.009 -0.010	-2.37	0.71	1357.69 1366.66 1373.98	-58.16	-58.08	0.047 0.005 0.017	0.72	-57.67 -58.58 -57.87
100		0.26	0.00	0.05 0.05	0.01 0.01	0.287	0.000	-0.030	-0.022	-3.43	0.08	1382.63 1389.60	-57.98	-57.83	0.003 0.003	0.12	-58.44 -57.37
	173 174 175	0.26	0.00 0.00 0.00	0.06 0.06 0.07	0.01 0.01 0.00	0.289	0.000	-0.042	-0.025	-4.77	-0.96	1397.84 1404.48 1412.30	-55.62	-55.58	0.002 0.002 0.002	-0.91	-57.53 -56.13 -55.87
105 106	176 177	0.25 0.25	0.00	0.07 0.08	$0.00 \\ -0.01$	0.278 0.278	0.000 0.000	-0.057 -0.071	-0.018 -0.011	-5.41 -5.83	-1.56 -1.76	1418.62 1426.13	-53.62 -53.06	-53.39 -52.39	0.002 0.002	-1.50 -1.67	-54.15 -53.56
107 108 109		0.25	0.00 0.00 0.00	0.09	-0.01 -0.02 -0.02	0.278	0.000	-0.084	-0.004	-6.62	-2.25	1432.11 1439.12 1444.51	-49.90	-49.06	0.003 0.005 0.071	-2.11	-51.49 -50.38 -47.70
110			0.00		-0.03			-0.099				1451.00					-46.05

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ_{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 71 ((L.II)															
	182	0.24	0.00	0.10	-0.03	0.268	0.000	-0.099	0.003	-7.05	-2.35	1455.95	-42.52			-2.14	-42.94
112	183	0.23			-0.04	0.255	0.000	-0.102	0.014			1462.10				-1.90	-40.94
	184	0.23		0.11	-0.05	0.256	0.000	-0.116	0.021			1466.98					-37.64
	185	0.22			-0.05	0.244		-0.117	0.023			1472.69					-35.23
115	186	0.21			-0.05	0.232		-0.107	0.026			1477.12					-31.60
	187	0.20			-0.04	0.221		-0.107	0.018			1482.53					-28.95
	188 189	0.18 0.15			-0.04 -0.03	0.198 0.164		-0.098 -0.077	0.022 0.018	-5.81 -4.55		1486.72 1491.78					-25.09 -22.15
		-0.13				-0.187		-0.077 -0.032	0.018	-4.05		1491.78					-22.13 -17.98
		-0.17				-0.177		-0.022				1501.01					-15.30
121	192	-0.15	0.00	0.03	-0.01	-0.156	0.000	-0.025	0.014	-4.33	-2.62	1504.82	-10.68			-2.57	-11.05
		-0.12		0.02		-0.125		-0.017	0.003	-4.04		1509.92	-7.70			-2.85	-8.07
		-0.09		0.03		-0.094		-0.032	-0.006	-4.86		1514.11	-3.82			-3.84	-4.12
		-0.07		0.03		-0.073		-0.033	-0.007			1519.10	-0.74			-4.24	-0.99
		-0.03		0.00		-0.032	0.000	0.000	0.000			1522.66	3.77			-4.92	3.53
	197	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1527.30	7.21			-5.24	7.02
	198 199	-0.02 0.00		-0.01 0.00	0.00	-0.021 0.000	0.000 0.000	0.012 0.000	-0.000 0.000	-5.32 -4.14		1529.15 1532.11	13.43 18.54			-4.42 -3.31	13.31 18.48
	200			-0.00	0.00	0.000	0.000	0.000	0.000	-2.96		1533.40	25.31			-3.31 -2.18	25.32
	201			-0.02	0.00	0.064	0.000	0.025		-1.88		1535.98	30.80			-0.93	30.90
131	202	0.09	0.00	-0.03	-0.01	0.096	0.000	0.040	0.014	-1.63	-0.43	1537.65	37.21			-0.36	37.43
	203			-0.04		0.107	0.000	0.053		-1.13		1540.50	42.43			0.42	42.78
133	204	0.11	0.00	-0.04	-0.01	0.118	0.000	0.054	0.016	-0.87	0.65	1542.11	48.89			0.77	49.32
	205			-0.04	0.00	0.119		0.054	0.007	-0.53		1544.87	54.20			1.35	54.72
	206			-0.04	0.00		-0.014	0.057		-0.32		1546.34	60.81			1.60	61.39
	207			-0.05	0.00	0.161	0.000	0.071	0.011			1549.13	66.09			1.99	66.83
	208 209			-0.05 -0.05	-0.01 0.00	0.173 0.183	0.000 0.000	0.072 0.074	0.022	-0.78 -0.64		1551.06 1553.74	72.22 77.61			1.61 1.79	73.11 78.57
	210			-0.05	0.00	0.183	0.000	0.074		-0.04 -0.93		1555.28	84.15			1.75	85.21
140				-0.04	0.01	0.205	0.000	0.065	0.001			1557.85	89.65			1.61	90.78
141	212	0.19	0.00	-0.04	0.01	0.205	0.000	0.065	0.001	-1.21	1.10	1559.35	96.22			1.20	97.46
	213			-0.03	0.01	0.216	0.000	0.055	-0.001	-1.14		1561.77	101.88			1.21	103.20
	214			-0.03	0.02	0.238	0.000		-0.009			1563.12	108.59			0.78	110.08
	215			-0.02	0.02	0.238	0.000		-0.012			1565.49					115.90
	216			-0.02	0.02	0.238	0.000		-0.012			1566.63	121.22				122.95
	217			-0.01	0.03	0.238	0.000		-0.025				127.06				129.03
	218 219	0.22		-0.01 0.00	0.03	0.238 0.239	0.000 0.000		-0.025 -0.028			1569.86 1571.84	134.14 140.23				136.26 142.52
	220	0.22		0.00	0.03	0.251	0.000		-0.028 -0.030				147.44				149.88
	221	0.23		0.02	0.02	0.251	0.000		-0.023				153.80				156.31
151	222	0.23	0.00	0.03	0.02	0.252	0.000	-0.011	-0.026	-4.24	-1.73	1575.07	161.21			-1.61	163.92
	223	0.23		0.04	0.02	0.253		-0.023					167.75			-1.58	170.70
153	224	0.23	0.00	0.04	0.02	0.253	0.000	-0.023	-0.029	-4.63	-2.08	1576.88	175.54				178.65
	225	0.23		0.05	0.02	0.254		-0.035					182.30				185.67
	226	0.23		0.06	0.01	0.254		-0.048					190.34				193.85
	227	0.23		0.06	0.01	0.254		-0.048					197.35			-2.03	201.07
	228 229	0.23		0.07 0.07	0.01	0.255 0.243		-0.060 -0.063					205.32 212.49			-2.44 -2.42	209.31 216.63
	230	0.22 0.22		0.07	0.00	0.243		-0.003 -0.075					212.49			-2.42 -2.99	210.03
	231	0.22			-0.01	0.244		-0.076					227.60				232.24
	232	0.22			-0.01	0.245		-0.088					235.71			-3.68	240.67
	233	0.22			-0.02	0.245		-0.101				1582.14	242.93			-3.74	248.27
163	234	0.22			-0.03	0.245		-0.103				1581.48	251.66			-3.88	257.29
	235	0.22			-0.03	0.245		-0.103				1581.61	259.60				
	236	0.21		0.10	-0.03	0.233		-0.105				1580.67	268.62				274.77
166	237	0.20	0.00	0.10	-0.04	0.221	0.000	-0.107	0.018	-6.93	-4.03	1580.75	276.60			-3.13	283.19

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 72 ((Hf)															
	149	0.18	0.00	0.08	-0.03	0.198	0.000	-0.085	0.014	-3.66	-0.92	1153.97	-7.67			-0.96	-7.00
		-0.17		0.05		-0.176		-0.045				1168.29				-1.29	
		-0.16 -0.15		0.05 0.04		-0.166 -0.156			-0.000 -0.003			1180.13 1194.19					-17.14 -23.19
		-0.13 -0.09		0.04		-0.130 -0.094		-0.037 -0.020				1205.82					-25.19 -26.80
	154		0.00	0.00	0.00	0.021	0.000	0.000	0.000			1219.45					-32.41
		-0.06		0.00		-0.063	0.000	0.001		-3.64		1229.20					-34.16
		-0.08				-0.084	0.000	0.014	-0.001			1240.63		-37.85	0.208		-37.57
	157 158			-0.02 -0.02	0.00	0.118 0.128	0.000 0.000	0.029		-2.20 -1.48		1249.39 1260.53		_42 10	0.018	-0.79 -0.01	-38.31 -41.44
	159			-0.01	0.00	0.150	0.000	0.020		-1.14		1269.61			0.017		-42.51
	160			-0.01	0.00	0.161	0.000		-0.002			1280.55			0.017		-45.42
89	161		0.00	0.00	0.01	0.172	0.000			-0.43		1289.47			0.023		-46.33
	162	0.17		0.00	0.01	0.183	0.000		-0.009			1300.10			0.010		-48.93
	163	0.18 0.19		0.00	0.01	0.194	0.000		-0.009 -0.009			1308.50			0.028		-49.31 -51.65
	164 165		0.00	0.00	0.01	0.206 0.217	0.000 0.000		-0.009 -0.009			1318.87 1327.03			0.020 0.028		-51.03 -51.78
94	166	0.21	0.00	0.01	0.01	0.228	0.000		-0.011			1337.12			0.028		-53.84
	167	0.22		0.01	0.00	0.239	0.000		-0.001			1345.06			0.028		-53.76
	168	0.23		0.02	0.00	0.251	0.000		-0.004			1354.87			0.028		-55.53
	169 170	0.24	0.00	0.02 0.03	0.00	0.262 0.274	0.000		-0.004 -0.006			1362.55 1372.04			0.028 0.028		-55.18 -56.61
	171		0.00	0.03	0.01	0.274			-0.016			1379.35			0.029		-55.89
100		0.25		0.04	0.01	0.275			-0.019			1388.44			0.024		-56.92
101		0.26		0.05	0.00	0.287			-0.013			1395.46			0.028		-55.91
102 103		0.26	0.00	0.06	0.00	0.288			-0.016			1404.16			0.003		-56.53 -55.20
103		0.26		0.06 0.07	0.00	0.288 0.278			-0.016 -0.018			1410.87 1419.23			0.003	-0.46 -0.63	
105			0.00		-0.01	0.277			-0.009						0.002	-1.13	
106	178	0.25	0.00	0.08	-0.01	0.278	0.000	-0.071	-0.011	-5.39	-1.42	1433.65	-53.28	-52.44	0.002	-1.32	-53.76
107			0.00		-0.01	0.267			-0.010 -0.004							-1.79	
108 109		0.24 0.24			-0.02 -0.02	0.267 0.267			-0.004 -0.004							-1.77 -2.02	
110			0.00		-0.03	0.268			0.003							-1.81	
111	183	0.23	0.00	0.10	-0.03	0.256	0.000	-0.101	0.004	-6.77	-2.23	1464.80	-44.07	-43.29	0.030	-2.02	-44.48
112			0.00		-0.04	0.256		-0.114						-41.50	0.040	-1.82	
113 114		0.22	0.00		-0.05 -0.05	0.244 0.233		-0.117 -0.119				1476.38 1482.67					-39.75 -37.92
115		0.21			-0.05	0.221		-0.109				1487.22					-34.44
116	188	0.19	0.00	0.10	-0.04	0.210	0.000	-0.109	0.019	-6.31	-2.24	1493.17	-32.09			-1.89	-32.32
117		0.18			-0.04	0.198		-0.098				1497.51					-28.61
118		0.15			-0.03 -0.02	0.164		-0.077				1503.18					-26.29
119 120		-0.14	0.00			0.152 -0.177		-0.065 -0.022				1506.95 1512.76					-22.04 -19.80
		-0.14				-0.146		-0.015				1516.74					-15.74
122	194	-0.11	0.00	0.02	0.00	-0.115	0.000	-0.018	0.002	-4.53	-3.47	1522.40	-12.89			-3.46	-13.31
		-0.09		0.03		-0.094		-0.031				1526.59	-9.01			-4.41	-9.37
		-0.07 -0.01		0.03		-0.073 -0.011	0.000 0.000	-0.033 0.000				1532.06 1535.60	-6.41 -1.88			-4.85 -5.49	-6.71 -2.19
125		0.00		0.00	0.00		0.000	0.000				1535.00	1.09			-5.49 -5.83	-2.19 0.84
		-0.02		0.00		-0.021	0.000	0.000				1542.61	7.26			-5.04	7.05
128	200	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.80	-3.93	1545.99	11.95			-3.93	11.80
129			0.00	0.00	0.00	0.011	0.000	0.000				1547.43	18.57			-2.91	18.49
130 131			0.00	0.00 -0.03	0.00 -0.01	0.011 0.086	0.000 0.000	0.000 0.039				1550.35 1551.74	23.72 30.41			-1.60 -0.69	23.70 30.53
132				-0.03			-0.014	0.037		-1.22		1554.92	35.30			0.13	35.50
133				-0.03			-0.056	0.042		-1.21		1556.51	41.78			0.55	42.08

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
	= 72 (Hf)															
134	206	0.11	0.02	-0.04	0.00	0.118	-0.028	0.054	0.007	-0.50	1.04	1559.68	46.69			1.14	47.06
135				-0.04	0.00		-0.014	0.056	0.008	-0.30		1561.08	53.35			1.49	53.81
136 137				-0.04 -0.05	0.00 -0.01	0.150 0.162	0.000 0.000	0.057 0.071	0.008	0.01 -0.58		1564.20 1565.81	58.31 64.76			1.90 1.92	58.87 65.50
138				-0.03	0.00	0.102	0.000	0.060	0.021	-0.36 -0.11		1569.07	69.57			1.87	70.33
139		0.17	0.00	-0.04	0.00	0.183	0.000	0.062	0.010	-0.50	1.56	1570.61	76.11			1.66	76.96
140		0.18	0.00	-0.04	0.00	0.194	0.000	0.063	0.011	-0.56	1.63	1573.61	81.18			1.75	82.16
141				-0.04	0.01	0.205	0.000	0.065		-1.00		1575.04	87.82			1.43	88.90
142 143				-0.03 -0.03	0.01 0.02	0.205 0.216	0.000 0.000		-0.001 -0.011	-0.76		1577.88 1579.18	93.05 99.82			1.42 1.07	94.21 101.14
				-0.03 -0.02					-0.011			1579.16				0.99	106.60
144 145				-0.02 -0.02	0.02	0.238 0.238	0.000 0.000		-0.012 -0.012			1581.90	105.18 112.05			0.59	113.59
146				-0.01	0.02	0.238	0.000		-0.015			1585.60	117.62			0.44	119.29
147	219	0.22	0.00	-0.01	0.03	0.238	0.000	0.036	-0.025	-2.57	-0.21	1586.70	124.59			-0.03	126.50
148	220	0.22	0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-2.49	-0.22	1588.96	130.40			-0.15	132.35
149		0.22		0.01	0.02	0.240	0.000		-0.021		-0.75		137.60			-0.68	139.71
150 151		0.22 0.23		0.02	0.02 0.02	0.240 0.252			-0.023 -0.026	-3.19			143.46 150.86			-0.81 -1.29	145.74 153.34
151		0.23		0.03	0.02	0.232			-0.026 -0.026			1594.57	157.08			-1.29 -1.26	159.73
153		0.22		0.04	0.02	0.242			-0.028				164.81			-1.58	167.67
154	226	0.22	0.00	0.05	0.02	0.243	0.000	-0.037	-0.031	-4.27	-1.76	1596.58	171.21			-1.49	174.32
155	227	0.22	0.00	0.05	0.01	0.242			-0.021		-1.99	1596.61	179.25			-1.84	182.42
156		0.22		0.06	0.01	0.243			-0.023				185.80			-1.77	189.24
157		0.22		0.07	0.00	0.243			-0.016				193.81			-2.19	197.44
158		0.22		0.07	0.00	0.243			-0.016				200.52			-2.21	204.36
159 160		0.22			-0.01 -0.01	0.244			-0.009 -0.011				208.47 215.15			-2.80 -2.91	212.57 219.58
161		0.22 0.22			-0.01	0.245 0.245			-0.011 -0.011				223.32			-2.91 -3.52	219.38
162		0.22			-0.02	0.245			-0.004				230.12			-3.63	235.13
163	235	0.21	0.00	0.10	-0.02	0.234	0.000	-0.103	-0.003	-7.70	-4.39	1601.55	238.88			-3.79	244.11
164	236	0.21	0.00	0.10	-0.03	0.233	0.000	-0.105	0.007	-7.39	-4.18	1602.17	246.34			-3.47	251.89
165		0.20			-0.03	0.222		-0.106	0.008	-7.39		1601.30	255.27			-3.59	261.08
166 167		0.20			-0.04 -0.05	0.221 0.222		-0.107 -0.120				1601.70 1601.02	262.95			-3.16	269.15 278.47
168		0.20			-0.05	0.222		-0.120 -0.110				1601.02					286.60
		T-)															
	= 73 ('	1a) −0.17	0.00	0.05	0.01	-0.176	0.000	-0.045	0.000	2 71	1.90	1165.84	4.10			1 02	-3.45
		-0.17 -0.16		0.05		-0.176 -0.166		-0.043 -0.047				1178.29					-3.43 -7.90
		-0.15		0.04		-0.156		-0.036				1192.41					-14.00
		-0.08		0.01		-0.084		-0.009				1204.65					-18.22
	155	0.02		0.00	0.00	0.021	0.000	0.000				1218.25				-4.29	-23.81
		-0.07		0.00		-0.073	0.000					1228.62		20. 62	0.200		-26.17
	157	0.08		0.00	0.01	0.085	0.000					1239.85		-29.63	0.209	-2.43	
	158 159			-0.01 -0.01	-0.01 0.00	0.107 0.128	0.000 0.000	0.016 0.018				1249.39 1260.53		-34.45	0.021	-1.48 -0.63	-30.92 -34.05
	160			-0.01	0.00	0.150	0.000	0.020				1270.05				-0.13	
88	161			-0.01	0.01	0.161	0.000	0.022	-0.007	-1.25	0.42	1281.03	-38.65				-38.52
	162	0.16		0.00	0.01	0.172	0.000		-0.009			1290.23		-39.78	0.052		-39.71
	163	0.17		0.01	0.01	0.184	0.000		-0.011			1301.17			0.038		-42.63
	164	0.17		0.01	0.01	0.184	0.000		-0.011			1309.99			0.028		-43.44 45.80
	165	0.18		0.01	0.01	0.195	0.000		-0.011			1320.38			0.017		-45.80
	166 167	0.19 0.20		0.01 0.02	0.01	0.206 0.217	0.000		-0.011 -0.004			1329.05 1339.15			0.028 0.028		-46.45 -48.52
	168	0.20		0.02	0.00	0.217			-0.004 -0.004			1347.47			0.028		-48.32 -48.82
	169	0.22		0.02	0.00	0.240			-0.004			1357.35			0.028		-50.66
97	170	0.22	0.00	0.02	0.00	0.240	0.000	-0.004	-0.004	-1.16	1.15	1365.43	-50.42	-50.14	0.028	1.13	-50.72
	171	0.22	0.00	0.03	0.00	0.252	0.000	-0.014	-0.006	-1.52	1.00	1374.92	-51.83	-51.72	0.028	1.00	-52.16

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 73 (Тэ)															
	- 73 (172		0.00	0.03	0.01	0.263	0.000	-0.010	-0.016	-2.03	0.76	1382.65	-51.50	-51 33	0.028	0.76	-51.86
	173	0.24		0.04	0.01	0.264			-0.019			1391.78			0.028		-52.93
	174	0.24		0.04	0.01	0.264			-0.019			1399.27			0.028	0.22	-52.39
	175	0.24		0.05	0.00	0.264			-0.012			1408.05			0.028		-53.11
	176	0.24		0.06	0.00	0.265	0.000	-0.047	-0.015	-3.71	-0.42	1415.23	-51.79	-51.37	0.031	-0.40	-52.25
	177	0.24		0.06	0.00	0.265			-0.015						0.004		-52.60
	178 179	0.24 0.23			-0.01 -0.01	0.266 0.254			-0.008 -0.007							-1.08 -1.34	
	180	0.23			-0.01	0.254			-0.007 -0.010							-1.80	
	181	0.23			-0.02	0.255			-0.000							-1.86	
109	182	0.23	0.00	0.09	-0.02	0.256	0.000	-0.088	-0.003	-6.34	-2.26	1458.79	-46.92	-46.43	0.002	-2.14	-47.40
	183	0.22	0.00	0.09	-0.03	0.244	0.000	-0.091	0.008	-6.14	-2.17	1465.86	-45.92	-45.30		-2.02	
	184	0.22			-0.03	0.245		-0.103				1471.49				-2.22	
	185 186	0.22 0.21			-0.04 -0.04	0.244 0.233		-0.104 -0.106				1478.25 1483.61			0.014 0.060	-2.09	-42.54 -39.83
														-36.01	0.000		
	187 188	0.20			-0.04 -0.05	0.221 0.221		-0.107 -0.109				1490.06 1495.24					-38.16 -35.21
	189	0.20			-0.03 -0.04	0.221		-0.109				1501.27					-33.21 -33.21
	190	0.17			-0.04	0.186		-0.087	0.025			1505.91					-29.80
118	191	0.15	0.00	0.07	-0.03	0.164	0.000	-0.077	0.018	-5.82	-3.02	1511.92	-27.41			-2.84	-27.79
119	192	0.14	0.00	0.06	-0.02	0.152	0.000	-0.065	0.011	-5.40	-3.05	1516.15	-23.56			-2.93	-24.00
		-0.17				-0.177		-0.022				1521.80					-21.58
		-0.14				-0.146		-0.015				1526.25					-18.00
		-0.11 -0.09		0.02		-0.115 -0.094		-0.018	-0.002			1531.99 1536.60					-15.65 -12.13
		-0.07		0.03		-0.073			-0.007				-9.16			-5.39	-9.52
		-0.07 -0.02		0.03		-0.073 -0.021	0.000	0.000		-6.90			-5.02			-5.99	-9.32 -5.39
		-0.01		0.00		-0.011	0.000	0.000		-7.28			-2.05			-6.30	-2.37
		-0.02		0.00		-0.021	0.000	0.000				1553.46	3.69			-5.50	3.42
128	201	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-5.24	-4.40	1556.89	8.34			-4.40	8.12
	202		0.00		0.00	0.032	0.000	0.012	0.000			1558.78	14.52			-3.41	14.36
		-0.02		0.00 -0.03		-0.021	0.000	0.000		-2.80			19.55			-2.18	19.44
	204 205					0.086 0.096	0.000	0.039 0.040		-2.43 -1.61		1566.70	25.93 30.81			-1.17 -0.33	25.95 30.91
	206			-0.03		0.118	0.000	0.041		-1.32		1568.67	36.91			0.10	37.08
134	207	0.11	0.00	-0.03	-0.01	0.118	0.000	0.041	0.015	-0.72	0.61	1571.87	41.78			0.69	42.03
	208			-0.03	0.00		-0.041	0.042		-0.52		1573.70	48.02			1.01	48.33
	209			-0.03	0.00	0.150	0.000	0.045		-0.11		1576.71	53.08			1.54	53.47
	210			-0.04	0.00	0.161	0.000	0.059		-0.47		1578.63	59.23			1.60	59.74
	211			-0.04	0.00	0.172	0.000	0.060		-0.36		1581.71	64.22			1.86	64.83
	212 213			-0.04 -0.03	0.00 0.00	0.183 0.183	0.000	0.062 0.049		-0.70 -0.37		1583.83 1586.80	70.18 75.28			1.46 1.56	70.88 76.04
	213			-0.03	0.00	0.183	0.000		-0.008			1588.59	81.56			1.28	82.42
	215			-0.03	0.01	0.205	0.000		-0.001			1591.50	86.72			1.26	87.71
143	216	0.20	0.00	-0.03	0.01	0.216	0.000	0.055	-0.001	-1.35	0.93	1593.08	93.21			0.98	94.30
144	217	0.22	0.00	-0.02	0.01	0.238	0.000	0.046	-0.002	-1.46	0.92	1595.76	98.60			0.95	99.79
	218			-0.02	0.02	0.238	0.000		-0.012			1597.37	105.07			0.49	106.41
	219			-0.01	0.02	0.238	0.000		-0.015			1599.88	110.63			0.44	112.10
	220 221	0.22 0.22		0.00	0.02	0.239 0.240	0.000		-0.018 -0.021				117.32 122.96			-0.03 -0.18	118.91 124.70
	222						0.000						122.90			-0.18 -0.71	
	222	0.22 0.22		0.01 0.02	0.02	0.240 0.240			-0.021 -0.023				129.79			-0.71 -0.87	131.66 137.65
	224	0.22		0.02	0.02	0.241			-0.026				142.61			-1.37	144.84
152	225	0.22	0.00	0.03	0.02	0.241	0.000	-0.013	-0.026	-3.82	-1.49	1610.14	148.80			-1.36	151.20
153	226	0.22	0.00	0.04	0.02	0.242	0.000	-0.025	-0.028	-4.27	-1.86	1610.85	156.15			-1.68	158.75
	227	0.22		0.05	0.01	0.242			-0.021				162.62				165.36
155	228	0.22	0.00	0.05	0.01	0.242	0.000	-0.038	-0.021	-4.58	-2.10	1612.97	170.18			-1.97	173.07

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	E _{mic}	E _{bind}	M _{th}	M _{exp}	σ _{exp}	E _{mic} (MaV)	M _{th} FL
156 299 0.22 0.00 0.06 0.01 0.243 0.00 -0.063 -0.023 -4.72 -2.12 1614.50 176.72 -1.90 179.845 175.730 0.22 0.00 0.07 0.00 0.243 0.00 -0.063 -0.016 -5.33 -5.25 1616.30 1814.55 -3.23 1914.65 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 1919.75 -2.33 1914.65 -2.35 -2.55 1616.30 1918.73 -2.35		5 2.4	(TF-)								(Me v)	(MeV)	(Mev)	(Mev)	(Mev)	(Mev)	(Mev)	(Mev)
157 250 0.22 0.00 0.07 0.00 0.25 0.00 0.003 -0.016 -5.35 -2.56 61-49 184.55 -2.34 187.65 159 239 0.21 0.00 0.007 0.00 0.023 0.000 -0.005 -0.015 -5.86 -2.57 616.29 191.75 -2.53 194.61 159 232 0.21 0.00 0.00 0.003 0.000 -0.005 -0.015 -5.86 -3.51 616.29 191.75 -3.53 -3.56 191.75 -3.51 191.75 -3.55			` /	0.00	0.06	0.01	0.242	0.000	0.050	0.000	4.50	2.12	161450	156.50			1.00	150.05
158 231 0.21 0.00 0.07 0.00 0.232 0.00 -0.005 -0.015 -3.26 -2.57 1616.70 191.07 -2.33 194.61 191.07 -2.33 194.61 191.07 -2.33 194.61 191.07 -2.34 -2.34																		
159 159 230 0.01 0.00 0.00 0.00 0.003 0.00 0.005																		
100 233 0.21 0.00 0.08 -0.01 0.233 0.00 -0.078 -0.010 -0.234 -3.43 1618.52 201.535 -1.11 209.355 -3.11 209.355 -3.11 209.355 -3.11 209.355 -3.11 209.355 -3.12 201.545 -3.12 201.545 -3.12 201.545 -3.12 201.545 -3.12 201.545 -3.12 201.545 -3.12																		
16 234																		
162 253 0.21 0.00 0.09 -0.02 0.223 0.000 -0.091 -0.001 -7.45 -4.34 1619.73 219.92 -3.88 224.97 163 236 0.20 0.00 0.01 -0.03 0.222 0.000 -0.016 0.008 -7.70 -4.51 1619.85 281.23 -3.22 240.76 165 238 0.19 0.00 0.09 -0.03 0.210 0.000 -0.096 0.011 -7.33 -4.51 1619.85 244.28 -3.22 240.76 166 239 0.19 0.00 0.09 -0.03 0.210 0.000 -0.096 0.011 -6.89 -4.16 1619.91 252.03 -3.55 257.55 167 240 0.18 0.00 0.10 -0.04 0.199 0.000 -0.110 0.020 -7.47 -4.61 1619.55 260.45 -3.71 266.54 169 240 0.17 0.00 0.10 -0.04 0.187 0.000 -0.111 0.021 -7.28 -4.41 1619.55 260.45 -3.40 27.24 -3.46 27.24 169 243 0.17 0.00 0.10 -0.04 0.187 0.000 -0.111 0.021 -7.28 -4.41 1619.95 277.24 -3.46 27.24 -3.46 27.24 257 243 0.17 0.00 0.10 -0.04 0.187 0.000 -0.111 0.021 -7.28 -4.41 1619.95 277.24 -3.46 27.24 -3.46 27.24 -3.46 27.24 258 1.55 -0.08 0.00 0.00 0.000 0.000 0.000 0.001 -0.013 0.000 -0.013 -7.16 -4.41 1619.95 277.24 -4.41 -3.46 27.24 -3.46 -3.46 27.24 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46 -3.46	160	233	0.21	0.00	0.08	-0.01	0.233	0.000	-0.078	-0.008	-6.34	-3.43	1618.15	205.35			-3.11	209.36
163 260 200 000 0.00 -0.02 0.022 0.000 -0.003 0.000 -7.59 -4.61 16 19.49 28.23 -4.13 23.29 24.56 25.25 -3.22 24.56 24.25 -3.25 25.25 -3.22 24.56 24.25 -3.25 24.25 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 24.55 -3.25 -3.25 -3.25 24.55 -3.25 -3.25 24.55 -3.25 -3.25 24.55 -3.25 -3.25 24.55 -3.25 -	161	234	0.21	0.00	0.09	-0.01	0.234	0.000	-0.090	-0.010	-7.30	-4.13	1618.52	213.06			-3.71	217.36
164 237 0.20 0.00 0.01 0.003 0.222 0.000 0.006 0.008 7.70 -4.51 1619.58 34.42 35.55 -3.22 240.76 1616 239 0.19 0.00 0.009 0.003 0.010 0.004 0.011 -7.33 -4.51 1619.58 24.42 3.75 -3.22 240.76 1616 239 0.19 0.000 0.010	162	235	0.21	0.00	0.09	-0.02	0.233	0.000	-0.091	-0.001	-7.45	-4.34	1619.73	219.92			-3.88	224.47
165 238	163	236	0.20	0.00	0.09	-0.02	0.222	0.000	-0.093	0.000	-7.59	-4.61	1619.49	228.23			-4.13	232.99
166 29 0.19 0.00 0.09 0.00 0.00 0.00 0.00 0.0	164	237	0.20	0.00	0.10	-0.03	0.222	0.000	-0.106	0.008	-7.70	-4.51	1620.24	235.55			-3.82	240.76
167 240	165	238	0.19	0.00	0.09	-0.03	0.210	0.000	-0.096	0.011	-7.33	-4.51	1619.58	244.28			-3.92	249.60
167 240	166	239	0.19	0.00	0.09	-0.03	0.210	0.000	-0.096	0.011	-6.89	_4 16	1619 91	252 03			_3 55	257 59
168 241																		
169 242 0.17 0.00 0.10 0.04 0.187 0.000 0.111 0.021 7.28 4.41 1619.7 277.24 34.95 3.21 29.25																		
22 = 74 (W)																		
80				0.00	0.10	0.03	0.107	0.000	0.112	0.031	7.10	7.71	1017.27	204.73			3.21	272.03
81 155 -0.08 0.00 0.02 0.00 -0.084 0.000 0.001 0.000 -5.15 -4.37 1204.78 -11.62 -4.38 -10.93 -4.38 -10.93 -4.38 -10.93 -4.38 -10.93 -4.38 -10.93 -4.38 -10.93 -4.38 -10.93 -4.38 -4.			` /	0.00	0.04	0.01	0.125	0.000	0.020	0.002	5 A1	2 50	1102.25	7.06			2 52	6 50
82 156 -0.03 0.00 0.00 0.00 0.00 -0.032 0.000 0.000 0.000 -5.83 -5.07 121901 -17.78																		
83 157 -0.06 0.00 0.00 0.00 0.00 -0.063 0.000 0.001 0.000 -5.03 -4.34 1229.34 -20.04																		
184 158 0.08 0.00 0.00 0.00 0.085 0.000 0.003 0.000 0.415 0.303 1241.05 0.23.67 0.23.67 0.200 0.201 0.201 0.201 0.001 0.010 0.018 0.000 0.018 0.000 0.22.47 0.107 1262.17 2.28.65 0.29.36 0.209 0.201 0.28.2887 161 0.13 0.00 0.01 0.000 0.139 0.000 0.019 0.002 0.002 0.05 1.28.181 0.33.52 0.3400 0.018 0.000 0.019 0.005 0.005 1283.18 0.33.52 0.3400 0.018 0.000 0.019 0.002 0.005 1283.18 0.33.52 0.3400 0.018 0.000 0.019 0.002 0.005 0.005 1.28.181 0.33.52 0.3400 0.018 0.000 0.001 0.005 0.																		
18																		
86 160 0.12 0.00 -0.01 0.00 0.013 0.000 0.128 0.000 0.018 0.002 -2.47 -1.07 1262.17 -28.65 -29.36 0.209 -1.08 -28.28 87 161 0.13 0.00 -0.01 0.000 0.139 0.000 0.019 0.002 -2.01 -0.52 1271.72 -30.13 -0.53 -29.83 88 162 0.14 0.00 -0.01 0.00 0.150 0.000 0.020 0.002 -1.50 0.05 1283.18 -33.52 -34.00 0.018 0.04 -33.27 89 163 0.15 0.00 0.01 0.00 0.162 0.000 -0.003 -0.001 -1.12 0.48 1292.39 -34.66 -34.91 0.053 0.46 -34.48 100 164 0.16 0.00 0.01 0.01 0.01 0.173 0.000 -0.001 -0.001 -0.56 0.94 1312.09 -38.81 -38.86 0.025 0.85 -37.64 1165 0.16 0.00 0.01 0.01 0.173 0.000 -0.001 -0.011 -0.56 0.94 1312.09 -38.81 -38.86 0.025 0.93 -38.74 127 165 0.16 0.00 0.01 0.01 0.184 0.000 0.001 -0.011 -0.56 0.94 1312.09 -38.81 -38.86 0.025 0.93 -38.74 128 167 0.18 0.00 0.01 0.00 0.184 0.000 0.001 -0.011 -0.56 0.94 1312.09 -38.81 -38.86 0.025 0.93 -38.74 128 168 0.19 0.00 0.02 0.00 0.266 0.000 -0.002 -0.001 -0.31 1.37 1332.14 -42.12 -42.09 0.010 1.21 -41.55 128 169 0.20 0.00 0.02 0.00 0.206 0.000 -0.009 -0.003 -0.33 1.44 1342.73 -44.65 -44.89 0.016 1.44 -44.72 129 169 0.20 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.44 -44.72 129 171 0.100 0.00 0.02 0.00 0.229 0.000 -0.005 -0.004 -0.79 1.32 1369.41 -42.11 -47.00 -47.09 0.028 1.31 -47.32 129 173 0.22 0.00 0.03 0.01 0.240 0.000 -0.005 -0.004 -0.79 1.32 1369.41 -47.10 -47.09 0.028 1.31 -47.32 120 174 0.22 0.00 0.03 0.01 0.240 0.000 -0.004 -0.004 -0.79 1.32 1369.41 -47.10 -47.09 0.028 1.21 -49.23 120 175 0.23 0.00 0.03 0.01 0.240 0.000 -0.004 -0.004 -0.79 1.32 1369.41 -40.40 0.40 0.028 1.00 -48.97 120 176 0.23 0.00 0.03 0.01 0.240 0.000 -0.004 -0.004 -0.79 1.32 1369.41 -40.40 0.40 0.028 1.31 -47.32 120 177 0.23 0.00 0.03 0.01 0.240 0.000 -0.004 -0.004 -0.79 1.32 1369.41 -40.40 0.40 0.028 1.31 -47.32 120 175 0.23 0.00 0.03 0.01 0.240 0.000 -0.004 -0.004 -0.79 1.32 1369.41 -40.40 0.40 0.028 1.31 -47.32 120 177 0.23 0.00 0.05 0.00 0.253 0.000 0.005 0.004 0.004 0.009 0.004 0.009 0.004 0.009 0.004 0.009 0.004 0.009 0.004 0.0	84	158	0.08	0.00	0.00	0.00	0.085	0.000	0.003	0.000	-4.15	-3.03	1241.05	-23.67				
87 161 0.13 0.00 -0.01 0.00 0.159 0.000 0.019 0.002 -2.01 -0.52 1271.72 -30.13	85	159	0.10	0.00	0.00	-0.01	0.107	0.000	0.004	0.010	-3.26	-2.01	1250.59	-25.15			-2.01	-24.72
88 162 0.14 0.00 -0.01 0.00 0.150 0.000 0.200 0.002 -1.50 0.05 1283.18 -33.52 -34.00 0.018 0.04 -33.27 89 163 0.15 0.00 0.01 0.00 0.162 0.000 -0.003 -0.001 -1.12 0.48 1292.39 -34.66 -34.91 0.053 0.46 -34.48 91 165 0.16 0.00 0.01 0.01 0.013 0.000 -0.001 -0.001 -0.82 0.86 1303.57 -37.77 -38.23 0.012 0.85 -37.64 91 165 0.16 0.00 0.01 0.01 0.013 0.000 -0.001 -0.011 -0.55 0.94 1312.69 -38.81 -38.86 0.025 0.93 -38.74 92 166 0.17 0.00 0.01 0.01 0.01 0.184 0.000 0.001 -0.011 -0.38 1.22 1323.52 -41.58 -41.89 0.010 1.21 -41.55 94 168 0.19 0.00 0.02 0.00 0.195 0.000 0.002 -0.001 -0.31 1.37 1332.52 -44.55 -44.89 0.016 1.44 -44.72 95 169 0.20 0.00 0.02 0.00 0.206 0.000 -0.009 -0.003 -0.33 1.44 1342.73 -44.65 -44.89 0.016 1.44 -44.72 95 169 0.20 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.45 -45.04 96 170 0.20 0.00 0.02 0.00 0.227 0.000 -0.007 -0.004 -0.50 1.44 1361.33 -47.10 -47.29 0.015 1.45 -45.04 99 173 0.22 0.00 0.02 0.00 0.229 0.000 -0.005 -0.004 -0.50 1.44 1361.33 -47.10 -47.09 0.028 1.31 -47.32 99 173 0.22 0.00 0.03 0.01 0.240 0.000 -0.004 -0.016 -1.00 1387.12 -48.68 -48.73 0.028 1.31 -47.32 99 173 0.22 0.00 0.03 0.01 0.240 0.000 -0.014 -0.016 -1.54 0.87 1396.69 -50.17 -50.23 0.028 0.89 -50.49 101 175 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.45 0.36 1413.44 -95.07 -95.04 0.028 0.57 -49.95 102 176 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.45 0.36 1413.44 -95.07 -95.04 0.006 -0.00 0.254 0.000 -0.008 -0.014 -0.016 -1.54 0.87 1396.69 -50.17 -50.23 0.028 0.89 -50.49 110 175 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.45 0.36 1413.44 -95.07 -95.04 0.006 -0.07 -0.038 -0.012 -2.88 0.00 142.05 -49.92 0.94 0.00 0.00 0.028 0.05 0.00 0.254 0.000 -0.038 -0.012 -2.88 0.00 142.05 -49.92 0.000 -0.005 -0.004 -0.006 0.005 0.00 0.254 0.000 -0.038 0.01 -2.45 0.36 1413.44 -95.07 -95.08 0.50 0.00 0.254 0.000 0.005 0.007 0.001 0.33 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.038 0.000 0.039 0.000 0.0	86	160	0.12	0.00	-0.01	0.00	0.128	0.000	0.018	0.002	-2.47	-1.07	1262.17	-28.65	-29.36	0.209	-1.08	-28.28
89 163 0.15 0.00 0.01 0.00 0.162 0.000 -0.003 -0.001 -1.12 0.48 1292.39 -34.66 -34.91 0.053 0.46 -34.48 90 164 0.16 0.00 0.01 0.00 0.173 0.000 -0.001 -0.001 -0.82 0.86 1303.57 -37.77 -38.23 0.012 0.85 -37.64 91 165 0.16 0.00 0.01 0.01 0.173 0.000 -0.001 -0.011 -0.56 0.94 1312.69 -38.81 -38.86 0.025 0.93 -38.76 92 166 0.17 0.00 0.01 0.01 0.184 0.000 0.001 -0.011 -0.38 1.22 1323.52 -41.58 -41.89 0.010 1.21 -41.55 93 167 0.18 0.00 0.01 0.00 0.195 0.000 0.001 -0.001 -0.31 1.37 1332.14 -42.12 -42.09 0.019 1.36 -42.15 94 168 0.19 0.00 0.02 0.00 0.206 0.000 -0.009 -0.003 -0.33 1.44 1342.73 -44.65 -44.89 0.016 1.44 -44.72 95 169 0.20 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.45 -45.04 96 170 0.20 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.45 -45.04 98 172 0.22 0.00 0.02 0.00 0.229 0.000 -0.005 -0.004 -0.59 1.44 1361.33 -47.10 -47.29 0.015 1.44 -47.27 97 171 0.21 0.00 0.02 0.00 0.229 0.000 -0.005 -0.004 -0.79 1.32 1369.41 -47.10 -47.09 0.028 1.31 -47.32 99 173 0.22 0.00 0.03 0.01 0.240 0.000 -0.002 -0.013 1.06 1.20 1379.36 -48.99 49.10 0.028 1.21 -49.99 173 0.22 0.00 0.03 0.01 0.241 0.000 -0.014 -0.016 -1.40 1.00 1387.12 -48.68 -48.73 0.028 1.21 -49.91 175 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.45 0.36 1414.34 -50.78 -50.64 0.028 0.57 -49.95 101 175 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.45 0.36 1414.34 -50.78 -50.64 0.028 0.38 -51.15 103 177 0.23 0.00 0.06 0.00 0.254 0.000 -0.038 -0.012 -2.45 0.36 1413.44 -50.78 -50.64 0.028 0.38 -51.15 11 11 145.18 50.20 0.00 0.07 -0.01 0.243 0.000 -0.065 -0.007 -4.30 -1.11 1445.18 50.23 49.64 0.004 -1.05 -0.27 -50.32 1016 180 0.22 0.00 0.07 -0.01 0.243 0.000 -0.065 -0.007 -4.30 -1.81 1458.9 -4.81 4.49 0.004 -1.05 -0.07 -50.67 107 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.065 -0.007 -4.30 -1.81 1458.9 4.45.9 4.45.5 0.005 -1.50 -4.91 11 11 185 0.20 0.00 0.07 -0.01 0.243 0.000 -0.065 -0.007 -4.30 -1.81 1458.9 4.45.0 -4.45.3 0.001 -1.79 -4.71 11 11 1458.9 0.00 0.00 0.09 -0.03 0.221 0.000 -0.0	87	161	0.13	0.00	-0.01	0.00	0.139	0.000	0.019	0.002	-2.01	-0.52	1271.72	-30.13			-0.53	-29.83
90 164 0.16 0.00 0.01 0.00 0.173 0.000 -0.001 -0.001 -0.82 0.86 1303.57 -37.77 -38.23 0.012 0.85 -37.64 91 165 0.16 0.00 0.01 0.01 0.173 0.000 -0.001 -0.011 -0.56 0.94 1312.69 -38.81 -38.86 0.025 0.93 -38.74 92 166 0.17 0.00 0.01 0.00 0.015 0.000 0.002 -0.001 -0.31 1.37 1332.14 -42.12 -42.09 0.019 1.36 -42.15 94 168 0.19 0.00 0.02 0.00 0.02 0.000 0.002 -0.001 -0.31 1.37 1332.14 -42.12 -42.09 0.019 1.36 -42.15 94 168 0.19 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.44 -44.72 96 170 0.20 0.00 0.02 0.00 0.217 0.000 -0.007 -0.004 -0.45 1.46 1351.07 -44.91 -44.92 0.015 1.44 -47.27 97 171 0.21 0.00 0.02 0.00 0.229 0.000 -0.005 -0.004 -0.50 1.44 1361.33 -47.10 -47.29 0.015 1.44 -47.29 91 173 0.22 0.00 0.02 0.01 0.240 0.000 -0.005 -0.004 -0.79 1.32 1369.41 -47.11 -47.09 0.028 1.31 -47.32 91 173 0.22 0.00 0.03 0.01 0.241 0.000 -0.014 -0.016 -1.40 1.00 1387.12 -48.68 -48.73 0.028 1.00 -48.97 101 175 0.23 0.00 0.03 0.01 0.241 0.000 -0.014 -0.016 -1.54 0.87 1396.69 -50.17 -50.23 0.028 0.89 -50.48 101 175 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.48 -0.04 142.065 -49.92 -49.70 0.028 0.38 -51.15 179 0.23 0.00 0.05 0.00 0.253 0.000 -0.038 -0.012 -2.48 -0.04 142.065 -49.92 -49.70 0.028 0.38 -51.15 179 0.23 0.00 0.06 0.00 0.254 0.000 -0.049 -0.014 -3.36 -0.77 1436.51 -49.64 -49.30 0.016 -0.73 -50.09 101 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.049 -0.014 -3.36 -0.77 1436.51 -49.64 -49.30 0.016 -0.73 -50.09 101 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.049 -0.014 -3.36 -0.77 1436.51 -49.64 -49.30 0.016 -0.73 -50.09 101 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.049 -0.014 -3.86 -0.77 1436.51 -49.64 -49.30 0.016 -0.73 -50.09 101 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.049 -0.014 -3.86 -0.77 1436.51 -49.64 -49.30 0.016 -0.73 -50.09 101 181 0.22 0.00 0.07 -0.01 0.243 0.000 -0.055 0.007 -4.31 -1.11 1445.18 -0.50 -50.86 -40.92 -40.70 0.028 -0.02 -50.33 112 188 0.20 0.00 0.09 -0.03 0.232 0.000 -0.055 0.007 -4.31 -1.11 1445.18 -40.50 -40.99 -40.00 -1.60 -49.00 -40.00 -40.00 -40.00 -40.00 -40.00 -4	88	162	0.14	0.00	-0.01	0.00	0.150	0.000	0.020	0.002	-1.50	0.05	1283.18	-33.52	-34.00	0.018	0.04	-33.27
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	104	178	0.23	0.00	0.06	0.00	0.254	0.000	-0.049	-0.014	-3.37	-0.31	1429.60	-50.80	-50.42	0.015	-0.27	-51.21
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	106	180	0.22	0.00	0.07	-0.01	0.243	0.000	-0.065	-0.007	-4.31	-1.11	1445.18	-50.23	-49.64			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	107	181	0.22	0.00	0.07	-0.01	0.243	0.000	-0.065	-0.007	-4.80	-1.56	1451.74	-48.72	-48.25	0.005	-1.50	-49.19
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	108	182	0.21	0.00	0.07	-0.01	0.232	0.000	-0.066	-0.006	-4.79	-1.68	1459.82	-48.73	-48.25	0.001	-1.60	-49.20
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	109	183	0.22	0.00	0.08	-0.02	0.243	0.000	-0.078	0.001	-5.48	-1.89	1465.80	-46.65	-46.37	0.001	-1.79	-47.11
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	110	184	0.21	0.00	0.09	-0.03	0.232	0.000	-0.093	0.009	-5.74	-1.88	1473.42	-46.19	-45.71	0.001	-1.72	-46.60
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$119 \ 193 0.14 \ 0.00 0.07 \ -0.03 0.153 \ 0.000 \ -0.078 0.019 \ -6.34 \ -3.62 \ 1526.61 \ -26.74 \qquad \qquad -3.44 \ -27.12$																		
$120 \ 194 \ -0.15 \ 0.00 \ \ 0.02 \ \ -0.02 \ \ -0.156 \ \ 0.000 \ \ -0.013 \ \ \ 0.022 \ \ \ -5.26 \ \ \ -3.55 \ \ 1532.59 \ \ \ -24.65 $																		
	120	194	-0.15	0.00	0.02	-0.02	-0.156	0.000	-0.013	0.022	-5.26	-3.55	1532.59	-24.65			-3.49	-25.13

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 74	(W)															
		-0.12	0.00	0.02	-0.01	-0.125	0.000	-0.017	0.012	-5.49	-4.25	1537.25	-21.24			-4.22	-21.74
		-0.11		0.02		-0.115		-0.018	0.002	-5.71		1543.40					-19.80
		-0.08 -0.06		0.03		-0.084 -0.063		-0.032 -0.033	-0.007 -0.007			1548.10 1554.05					-16.38 -14.22
	199	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-7.73		1558.11	-9.81				-10.22
126	200	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.12	-7.08	1563.65	-7.28			-7.08	-7.65
127	201	-0.02		-0.01	0.00	-0.021	0.000	0.012	-0.000	-7.20		1565.96	-1.52			-6.22	-1.85
	202 203		0.00	0.00	0.00 0.00	0.000 -0.011	0.000 0.000	0.000 0.000	0.000 0.000	-6.06 -4.86		1569.83 1571.72	2.68 8.87			-5.15 -4.12	2.40 8.64
	204		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.59		1575.15	13.51			-2.86	13.32
131	205	0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-2.50	-1.80	1576.77	19.96			-1.81	19.84
	206			-0.02		0.075	0.000	0.026	0.012	-1.80		1580.23	24.57			-0.79	24.55
	207 208			-0.03 -0.03	-0.01 -0.01	0.107 0.118	0.000 0.000	0.041 0.041	0.014 0.015	-1.61 -1.03		1582.16 1585.71	30.71 35.23			-0.26 0.38	30.78 35.38
	209			-0.03	0.00	0.118	-0.055	0.041	0.013	-0.96		1585.71	41.44			0.38	41.66
	210			-0.03	0.00	0.118	-0.014	0.042	0.005	-0.04		1590.94	46.14			1.29	46.42
137	211	0.14	0.00	-0.04	-0.01	0.151	0.000	0.057	0.018	-0.52	1.38	1592.78	52.38			1.50	52.81
	212			-0.03	0.00	0.161	0.000	0.046	0.007	-0.02		1596.17	57.06			1.77	57.51
	213 214			-0.04 -0.03	0.00	0.172 0.183	0.000 0.000	0.060 0.049	0.009 0.008	-0.53 -0.28		1598.03 1601.57	63.27 67.80			1.70 1.62	63.85 68.43
	215			-0.03	0.00	0.194	0.000	0.051	0.008	-0.67		1603.34	74.10			1.39	74.83
	216			-0.03	0.01	0.194	0.000	0.051	-0.002			1606.56	78.96			1.46	79.80
	217			-0.03	0.01	0.205	0.000	0.053	-0.001			1608.19	85.39			1.15	86.33
	218			-0.02	0.01	0.216	0.000		-0.003	-0.96		1611.21	90.44			1.17	91.47
	219			-0.02 -0.01	0.02	0.238	0.000		-0.012 -0.015			1612.82 1615.71	96.91			0.74	98.09 103.39
140	220 221			-0.01	0.02	0.238 0.238	0.000 0.000		-0.015 -0.015			1617.10	102.09 108.76			0.09	1103.39
	222		0.00	0.00	0.02	0.239	0.000		-0.018			1619.88	114.06			0.11	115.61
	223		0.00	0.01	0.02	0.240	0.000		-0.021			1621.13	120.88			-0.40	122.57
	224		0.00	0.02	0.02	0.240	0.000		-0.023			1623.76	126.32			-0.56	128.18
151	225		0.00 0.00	0.02 0.03	0.02	0.240 0.241		-0.001 -0.013	-0.023 -0.026	-3.39 -3.45		1624.78 1627.07	133.37 139.15			-1.04 -1.02	135.36 141.34
	227		0.00	0.04	0.01	0.241			-0.019				146.59			-1.34	148.87
	228		0.00	0.05	0.01	0.242			-0.021				152.58				155.08
	229		0.00	0.05	0.01	0.242			-0.021								162.80
	230 231		0.00 0.00	0.06	0.00	0.243 0.231			-0.014 -0.013				166.38 174.04				169.22 177.05
	232		0.00	0.07	0.00	0.232			-0.015				180.22			-2.04	183.50
	233		0.00	0.07	0.00	0.221			-0.015				187.82				191.28
	234		0.00		-0.01	0.221			-0.007				194.04			-2.91	197.77
	235		0.00 0.00		-0.01	0.221			-0.007				201.82			-3.53	205.74
	236 237		0.00		-0.02 -0.02	0.222 0.210		-0.093 -0.094				1638.76 1638.54	208.18 216.47			-3.74 -3.99	212.44 220.95
	238		0.00		-0.02	0.210		-0.094				1639.45	223.63				228.32
165	239	0.19	0.00	0.09	-0.03	0.210	0.000	-0.096	0.011	-7.29	-4.47	1639.06	232.09			-3.88	237.08
	240		0.00		-0.03	0.199		-0.097				1639.79	239.43				244.68
	241242		0.00		-0.04 -0.04	0.199 0.187		-0.110 -0.099				1639.48 1639.81	247.81 255.55			-3.77 -3.31	
	242		0.00		-0.04 -0.05	0.187		-0.099 -0.112				1639.45	263.99				270.43
	244		0.00		-0.05	0.187		-0.112				1639.93	271.58				278.28
	245		0.00		-0.04	0.153		-0.102				1639.03	280.55				287.23
	246		0.00		-0.04	0.153		-0.102				1639.62	288.02			-3.79	
	247		0.00	0.08	-0.04	0.142	0.000	-0.091	0.028	- /.0 9	-5.10	1638.76	296.96			-4.26	304.07
	= 75 (` '	0.00	0.05	0.00	0.001	0.000	0.021	0.002			1002.00	2.25			<i>-</i>	
	156 157	-0.08	0.00 0.00	0.02	0.00	-0.084 0.043	0.000 0.000	-0.021 0.001				1202.80 1216.91					-1.51 -7.61
	157			-0.00	0.00	0.043	0.000	0.001				1210.91					-7.01 -10.30

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 75 (Re)															
	159	0.06	0.00	0.00	0.01	0.064	0.000	0.002	-0.010	-5.08	-4.04	1239.87	-15.20			-4.05	-14.57
85	160	0.10	0.00	0.01	-0.01	0.107	0.000	-0.008	0.009	-4.15	-2.85	1249.78	-17.04			-2.87	-16.49
	161	0.11			-0.01	0.118	0.000	0.005		-3.23		1261.41		-20.88	0.209	-1.91	
	162 163	0.12 0.14		0.00	-0.01 0.00	0.129 0.150	0.000 0.000	0.006				1271.38 1282.84		26.01	0.020		-22.08 -25.54
														-20.01	0.020		
	164 165	0.14 0.15		0.01	0.00 0.00	0.151 0.162			-0.001 -0.001	-1.69 -1.33		1292.53 1303.73		_30.66	0.028		-27.22 -30.40
	166	0.15		0.01	0.00	0.102			-0.001			1313.09		-30.00	0.028		-30.40 -31.76
92	167	0.16	0.00	0.02	0.00	0.173	0.000	-0.013	-0.003	-0.81	0.67	1324.23	-35.00			0.65	-34.88
93	168	0.17	0.00	0.02	0.00	0.184	0.000	-0.012	-0.003	-0.70	0.87	1333.30	-35.99	-35.79	0.031	0.85	-35.94
	169	0.18		0.03	0.00	0.196			-0.005			1343.86			0.028		-38.47
	170	0.19		0.02	0.00	0.206				-0.68		1352.71			0.026		-39.31
	171 172	0.19 0.20		0.02 0.02	0.00 0.00	0.206 0.217			-0.003 -0.004			1362.96 1371.47			0.028 0.054		-41.53 -42.02
	173	0.21		0.03	0.00	0.229			-0.006			1381.42			0.028		-43.94
	174	0.21		0.03	0.00	0.229			-0.006			1389.63			0.028		-44.12
100	175	0.21	0.00	0.03	0.00	0.229	0.000	-0.018	-0.006	-1.48	0.71	1399.25	-45.44	-45.29	0.028		-45.70
	176	0.21		0.04	0.00	0.230			-0.009			1407.22			0.028		-45.64
102 103		0.21 0.22		0.04	0.00 0.00	0.230 0.242			-0.009 -0.011			1416.51 1424.20			0.028 0.028		-46.89 -46.54
	179	0.22				0.242			-0.011 -0.004							-0.17 -0.44	
104		0.21			-0.01 -0.01	0.231			-0.004 -0.004						0.024 0.021	-0.44 -0.92	
106		0.21			-0.01	0.231			-0.004						0.013	-1.17	
107		0.21	0.00	0.07	-0.01	0.232			-0.006						0.102	-1.66	
108	183	0.21	0.00	0.07	-0.01	0.232	0.000	-0.066	-0.006	-4.95	-1.84	1464.51	-46.13	-45.81	0.008	-1.78	-46.58
109		0.20			-0.02	0.221		-0.081				1471.04				-2.06	
110 111		0.20			-0.02 -0.03	0.221 0.221		-0.081 -0.094				1478.73 1484.96			0.001 0.001	-2.06 -2.34	
111		0.20			-0.03 -0.04	0.221		-0.094 -0.095				1492.33				-2.34 -2.31	
113		0.19			-0.04	0.209		-0.097				1498.26				-2.65	
114	189	0.18	0.00	0.09	-0.04	0.198	0.000	-0.098	0.022	-6.55	-2.89	1505.33	-38.52	-37.98	0.008	-2.68	-38.89
115		0.18			-0.04	0.198		-0.098				1511.10			0.149	-3.17	
116		0.15			-0.03	0.164		-0.077				1517.68		-34.35	0.010	-3.12	
117 118	192	0.15	0.00		-0.03 -0.03	0.164 0.153		-0.077 -0.078				1523.32 1529.93					-32.74 -31.25
	194	0.14			-0.03	0.153		-0.078				1534.78					-28.02
	195	0.11			-0.02	0.119		-0.056				1540.71					-25.95
121	196	-0.12	0.00	0.02	-0.01	-0.125		-0.017	0.012	-6.18	-4.92	1545.88	-22.57				-23.09
		-0.10		0.02		-0.105		-0.019				1552.14					-21.27
		-0.08		0.03		-0.084			-0.007								-18.25
124 125		-0.07 0.02		0.03	0.01	-0.073 0.021	0.000	-0.033 0.000	-0.007			1563.24 1567.51					-16.16 -12.36
125		0.02		0.00	0.00	0.021	0.000	0.000				1573.06	-9.40			-7.25 -7.55	-12.30 -9.81
		-0.02		0.00		-0.021	0.000	0.000				1575.86	-4.14			-6.77	-4.51
128	203	0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-6.59	-5.61	1579.69	0.11			-5.61	-0.22
129	204	0.03	0.00	0.00	0.00	0.032	0.000	0.000	0.000	-5.47	-4.58	1581.99	5.88			-4.59	5.59
130		0.03		0.00	0.00	0.032	0.000	0.000				1585.49	10.46			-3.35	10.22
	206			-0.01	0.00	0.064 0.075	0.000 0.000	0.014				1587.67	16.35			-2.45 -1.44	16.16
132 133				-0.02 -0.03		0.075	0.000	0.026 0.040				1591.17 1593.42	20.92 26.74			-1.44 -0.83	20.82 26.73
134				-0.03			-0.028	0.041				1596.97	31.26			-0.14	31.32
135				-0.03	0.00		-0.028 -0.041	0.041		-1.37 -1.34		1599.20	37.10			0.22	37.21
136				-0.03	0.00	0.118	0.000	0.042		-0.56		1602.61	41.76			0.78	41.93
137				-0.03	0.00	0.139	0.000	0.044		-0.51		1604.72	47.73			1.05	47.97
138				-0.03	0.00	0.150	0.000	0.045		-0.30		1608.15	52.37			1.38	52.69
	214			-0.04	0.00	0.161	0.000	0.059		-0.70		1610.31	58.27			1.40	58.72
140	215	0.16	0.00	-0.03	0.00	0.172	0.000	0.048	0.007	-0.43	1.49	1613.66	62.99			1.54	63.50

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 75 (Re)															
141	216	0.17	0.00	-0.03	0.00	0.183	0.000	0.049	0.008	-0.77	1.12	1615.97	68.76			1.16	69.35
142				-0.03	0.01		0.000			-0.79		1619.19	73.61			1.26	74.31
	218 219			-0.03 -0.02	0.01		0.000 0.000			-1.19 -0.98		1621.15 1624.22	79.72 84.72			1.01 1.01	80.51 85.60
	220			-0.02	0.01		0.000			-0.36 -1.47		1626.06	90.95			0.68	91.92
	221	0.22	0.00	-0.01	0.01	0.238	0.000	0.034	-0.005	-1.64	0.61	1628.98	96.10			0.62	97.17
	222	0.22	0.00	-0.01	0.02		0.000		-0.015		0.09	1630.82	102.34			0.14	103.57
	223		0.00	0.00	0.02		0.000		-0.018			1633.60	107.63			0.04	108.99
	224 225		0.00	0.01	0.01		0.000 0.000		-0.011 -0.013	-2.65		1635.15 1637.76	114.15 119.62			-0.46 -0.57	115.57 121.19
	226		0.00	0.02	0.02				-0.023			1639.23	126.22			-1.05	127.99
151			0.00	0.02	0.02				-0.025 -0.026			1641.54	131.98			-1.03	133.94
153	228	0.22	0.00	0.04	0.01	0.241	0.000	-0.026	-0.019	-3.74	-1.43	1642.53	139.05			-1.35	141.10
	229		0.00	0.04	0.01				-0.019			1644.55	145.10			-1.28	147.31
	230		0.00	0.05	0.01				-0.021			1645.44	152.29			-1.56	154.70
156	231 232		0.00	0.05 0.06	0.01				-0.020 -0.013			1647.36 1648.23	158.43 165.64			-1.57 -2.05	161.02 168.40
	232		0.00	0.06	0.00				-0.013				171.87			-2.03 -2.16	174.81
	234		0.00		-0.01				-0.005				179.06			-2.79	182.22
160	235	0.19	0.00	0.07	-0.01	0.209	0.000	-0.070	-0.004	-5.73	-3.26	1652.75	185.34			-3.02	188.70
	236		0.00		-0.01				-0.006			1653.49	192.67			-3.64	196.30
	237		0.00		-0.01				-0.006			1655.08	199.14			-3.86	202.97
	238 239		0.00		-0.02 -0.03			-0.094 -0.096	0.001 0.011			1655.33 1656.40	206.97 213.97			-4.11 -3.88	211.12 218.42
	240		0.00		-0.03			-0.097				1656.33	222.11			-4.09	226.77
	241		0.00		-0.03			-0.098	0.013			1657.13	229.39			-3.81	234.29
	242		0.00		-0.04			-0.099	0.023	-7.41		1656.85	237.74			-3.84	243.00
	243		0.00		-0.04			-0.099	0.023	-7.12		1657.50	245.15			-3.61	250.65
	244 245		0.00		-0.04 -0.04			-0.101 -0.101	0.024 0.025	-7.32 -7.11		1657.20 1657.82	253.53 260.97			-3.88 -3.75	259.28 266.99
					-0.04			-0.101 -0.091				1657.50	269.36			-3.73 -4.27	275.53
171	246 247		0.00		-0.04 -0.04			-0.091 -0.091	0.027 0.027	-7.21 -7.20		1657.30	276.84			-4.27 -4.29	283.26
	248		0.00		-0.04			-0.091	0.028			1657.73	285.28			-4.80	291.97
	249		0.00		-0.04							1658.14					299.82
175	250	0.12	0.00	0.07	-0.04	0.130	0.000	-0.080	0.030	-7.66	-5.93	1657.43	301.73			-5.19	308.86
\boldsymbol{Z}	= 76 (Os)															
		-0.05		0.00		-0.052		0.001				1227.82				-6.01	-3.09
	160 161		0.00	0.01 0.03	0.00							1240.30 1250.21				-4.87 -3.62	-7.57 -9.48
	162		0.00		-0.00			-0.008				1262.21					-9.48 -13.48
	163		0.00		-0.01			-0.007				1272.16					-15.44
88	164	0.12	0.00	0.00	0.00	0.129	0.000	0.006	0.000	-2.38	-1.04	1284.06	-19.82	-20.46	0.209	-1.05	-19.33
	165		0.00	0.01	0.00							1293.75					-21.02
	166		0.00	0.01	0.00							1305.41			0.018		-24.67
	167 168		0.00	0.02	0.00				-0.003 -0.003			1314.79 1326.11			0.073 0.012		-26.04 -29.36
	169		0.00	0.02	0.00				-0.003			1335.51			0.012		-29.30 -30.74
	170		0.00	0.02	0.00				-0.003			1346.52			0.023		-33.73
	171		0.00	0.02	0.00			-0.012		-0.44		1355.28			0.019	1.04	-34.48
	172		0.00	0.02	0.00				-0.003			1366.01			0.015		-37.18
	173		0.00	0.02	0.00				-0.003			1374.50			0.015		-37.66
	174		0.00	0.02	0.00				-0.004			1384.94			0.011		-40.07
	175 176		0.00	0.02 0.03	0.00				-0.004 -0.006			1393.14 1403.24			0.014 0.028		-40.25 -42.31
	177		0.00	0.03	0.00				-0.006			1411.18			0.026		-42.23
102	178		0.00	0.04	0.00				-0.008			1420.97			0.016		-43.98
103	179	0.20	0.00	0.04	0.00	0.219	0.000	-0.031	-0.008	-1.99	0.16	1428.65	-43.34	-43.02	0.018	0.16	-43.63

$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-0.86 -1.31 -1.45 -1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-44.44 -45.58 -44.62 -45.19 -43.71 -43.80 -41.94 -41.70
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-0.52 -0.86 -1.31 -1.45 -1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-44.44 -45.58 -44.62 -45.19 -43.71 -43.80 -41.94 -41.70
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-0.86 -1.31 -1.45 -1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-45.58 -44.62 -45.19 -43.71 -43.80 -41.94 -41.70
107 183 0.20 0.00 0.06 -0.01 0.220 0.000 -0.056 -0.003 -3.97 -1.34 1461.82 -44.23 -43.66 0.050 108 184 0.20 0.00 0.07 -0.01 0.220 0.000 -0.068 -0.005 -4.40 -1.50 1470.47 -44.81 -44.26 0.001 109 185 0.20 0.00 0.07 -0.02 0.220 0.000 -0.069 0.005 -4.68 -1.78 1477.04 -43.30 -42.81 0.001 110 186 0.19 0.00 0.08 -0.02 0.209 0.000 -0.083 0.003 -4.92 -1.82 1485.21 -43.40 -43.00 0.001 111 187 0.19 0.00 0.08 -0.03 0.209 0.000 -0.084 0.013 -5.31 -2.07 1491.42 -41.55 -41.22 0.001	-1.31 -1.45 -1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-44.62 -45.19 -43.71 -43.80 -41.94 -41.70
108 184 0.20 0.00 0.07 -0.01 0.220 0.000 -0.068 -0.005 -4.40 -1.50 1470.47 -44.81 -44.26 0.001 109 185 0.20 0.00 0.07 -0.02 0.220 0.000 -0.069 0.005 -4.68 -1.78 1477.04 -43.30 -42.81 0.001 110 186 0.19 0.00 0.08 -0.02 0.209 0.000 -0.083 0.003 -4.92 -1.82 1485.21 -43.40 -43.00 0.001 111 187 0.19 0.00 0.08 -0.03 0.209 0.000 -0.084 0.013 -5.31 -2.07 1491.42 -41.55 -41.22 0.001	-1.45 -1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-45.19 -43.71 -43.80 -41.94 -41.70
109 185 0.20 0.00 0.07 -0.02 0.220 0.000 -0.069 0.005 -4.68 -1.78 1477.04 -43.30 -42.81 0.001 110 186 0.19 0.00 0.08 -0.02 0.209 0.000 -0.083 0.003 -4.92 -1.82 1485.21 -43.40 -43.00 0.001 111 187 0.19 0.00 0.08 -0.03 0.209 0.000 -0.084 0.013 -5.31 -2.07 1491.42 -41.55 -41.22 0.001	-1.72 -1.72 -1.96 -1.98 -2.41 -2.26	-43.71 -43.80 -41.94 -41.70
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-1.72 -1.96 -1.98 -2.41 -2.26	-43.80 -41.94 -41.70
$111\ 187\ \ 0.19\ 0.00\ \ 0.08\ \ -0.03\ \ \ 0.209\ \ \ 0.000\ \ -0.084\ \ \ \ 0.013\ \ \ -5.31\ \ \ -2.07\ \ 1491.42\ \ \ \ \ -41.55\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	-1.96 -1.98 -2.41 -2.26	-41.94 -41.70
	-1.98 -2.41 -2.26	-41.70
	-2.26	-39.72
$113\ 189 0.18\ 0.00 0.08\ -0.03 0.198 0.000\ -0.085 0.014\ -5.67\ -2.54\ 1505.33\ -39.31\ -38.99 0.001$		
$114\ 190\ 0.17\ 0.00\ 0.08\ -0.03\ 0.187\ 0.000\ -0.086\ 0.015\ -5.71\ -2.41\ 1512.67\ -38.58\ -38.71\ 0.001$	2.01	-38.98
$115 \ 191 0.15 \ 0.00 0.07 \ -0.03 0.164 0.000 \ -0.077 0.018 \ -5.79 \ -2.94 \ 1518.52 \ -36.36 \ -36.39 0.0019999999999999999999999999999999999$		-36.79
116 192 0.15 0.00 0.07 -0.03 0.164 0.000 -0.077 0.018 -6.24 -3.40 1526.12 -35.89 -35.88 0.003		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		
119 195 0.11 0.00 0.06 -0.02 0.119 0.000 -0.068 0.013 -6.87 -4.66 1543.97 -29.53 -29.69 0.500		
120 196 0.11 0.00 0.05 -0.02 0.119 0.000 -0.056 0.013 -0.87 -4.00 1343.97 -29.35 -29.09 0.300		
121 197 -0.11 0.00 0.02 -0.01 -0.115 0.000 -0.018 0.012 -6.74 -5.59 1555.88 -25.29	-5.57	
$122\ 198\ -0.09\ 0.00\ 0.02\ 0.00\ -0.094\ 0.000\ -0.020\ 0.002\ -7.06\ -6.12\ 1562.65\ -23.99$	-6.11	-24.50
123 199 -0.07 0.00 0.02 0.00 -0.073 0.000 -0.021 0.002 -7.93 -7.04 1567.73 -20.99	-7.03	-21.49
$124\ 200\ -0.06\ 0.00\ 0.03\ 0.01\ -0.063\ 0.000\ -0.033\ -0.007\ -8.65\ -7.57\ 1574.20\ -19.40$	-7.53	
125 201 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -9.26 -8.22 1578.74 -15.87	-8.22	
126 202 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -9.62 -8.52 1584.73 -13.78 127 203 -0.02 0.00 0.00 0.00 -0.021 0.000 0.000 0.000 -8.65 -7.66 1587.49 -8.47	-8.53 -7.66	-14.22 -8.88
128 204 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -8.03 -7.00 1387.49 -8.47	-6.57	-5.08
129 205 -0.01 0.00 0.00 0.00 -0.011 0.000 0.000 0.000 -6.31 -5.50 1594.11 1.06	-5.51	0.72
130 206	-4.24	4.96
131 207 0.02 0.00 0.00 0.00 0.021 0.000 0.000 0.000 -3.96 -3.16 1600.02 11.29	-3.16	11.04
132 208 0.05 0.00 -0.01 0.00 0.053 0.000 0.013 0.001 -2.92 -2.07 1603.81 15.56	-2.07	15.37
133 209 0.08 0.00 -0.02 -0.01 0.086 0.000 0.027 0.012 -2.41 -1.37 1605.99 21.46	-1.34	21.35
134 210 0.09 0.02 -0.02 -0.01 0.096 -0.028 0.027 0.013 -1.79 -0.64 1609.89 25.62	-0.60	25.58
135 211 0.11 0.04 -0.02 0.00 0.118 -0.055 0.030 0.004 -1.71 -0.21 1612.10 31.49 136 212 0.11 0.03 -0.02 0.00 0.118 -0.041 0.030 0.004 -0.94 0.39 1615.89 35.77	-0.17 0.42	31.51 35.85
137 213 0.11 0.00 -0.03 0.00 0.118 -0.041 0.030 0.004 -0.54 0.39 1013.89 35.77	0.42	41.89
138 214 0.13 0.00 -0.02 0.00 0.139 0.000 0.032 0.004 -0.16 1.15 1621.68 46.12	1.18	46.33
139 215 0.14 0.00 -0.03 0.00 0.150 0.000 0.045 0.006 -0.40 1.22 1623.79 52.08	1.27	52.39
140 216 0.15 0.00 -0.03 0.00 0.161 0.000 0.046 0.007 -0.28 1.46 1627.47 56.47	1.52	56.87
141 217 0.16 0.00 -0.03 0.00 0.172 0.000 0.048 0.007 -0.57 1.16 1629.74 62.28	1.22	62.76
142 218 0.17 0.00 -0.03 0.00 0.183 0.000 0.049 0.008 -0.56 1.27 1633.32 66.77	1.34	67.35
143 219 0.18 0.00 -0.03 0.01 0.194 0.000 0.051 -0.002 -0.90 1.07 1635.27 72.89	1.13	73.56
144 220 0.19 0.00 -0.03 0.01 0.205 0.000 0.053 -0.001 -0.96 1.12 1638.70 77.53 145 221 0.20 0.00 -0.02 0.01 0.216 0.000 0.043 -0.003 -1.26 0.82 1640.54 83.77	1.18 0.86	78.30 84.61
145 221 0.20 0.00 -0.02 0.01 0.210 0.000 0.043 -0.003 -1.20 0.02 1040.34 83.77 146 222 0.22 0.00 -0.01 0.01 0.238 0.000 0.034 -0.005 -1.37 0.81 1643.81 88.56	0.83	89.50
147 223	0.38	95.90
$148\ \ 224 \ 0.22\ \ 0.00 \ 0.00 \ 0.01 \ 0.239 \ 0.000 \ 0.022 \ \ -0.008 \ -1.85 \ 0.28 \ \ 1648.72 \ 99.79$	0.30	100.94
149 225 0.22 0.00 0.01 0.01 0.239 0.000 0.010 -0.011 -2.33 -0.19 1650.33 106.25	-0.18	107.52
$150\ 226 0.22\ 0.00 0.01 0.01 0.239 0.000 0.010\ -0.011\ -2.41\ -0.30\ 1653.29\ 111.37$		112.76
151 227 0.22 0.00 0.02 0.01 0.240 0.000 -0.002 -0.013 -2.92 -0.77 1654.71 118.02		119.54
152 228		125.16
153 229 0.22 0.00 0.03 0.01 0.241 0.000 -0.014 -0.016 -3.19 -1.02 1658.37 130.50		132.33
154 230 0.22 0.00 0.04 0.01 0.241 0.000 -0.026 -0.019 -3.20 -0.98 1660.78 136.16 155 231 0.20 0.00 0.04 0.01 0.219 0.000 -0.030 -0.018 -3.29 -1.25 1661.63 143.39		138.18 145.55
155 251 0.20 0.00 0.04 0.01 0.219 0.000 -0.030 -0.018 -3.29 -1.25 1661.65 145.39 156 232 0.20 0.00 0.05 0.00 0.219 0.000 -0.043 -0.010 -3.39 -1.27 1663.91 149.18		145.55
157 233 0.19 0.00 0.05 0.00 0.208 0.000 -0.045 -0.010 -3.76 -1.71 1664.75 156.41		158.89
$158\ \ 234 \ \ 0.19\ \ 0.00 \ \ 0.06 \ \ 0.00 \ \ 0.209 \ \ 0.000 \ \ -0.057 \ \ -0.012 \ \ -4.12 \ \ -1.92 1667.04 162.20$		164.90
159 235 0.19 0.00 0.06 -0.01 0.208 0.000 -0.058 -0.002 -4.69 -2.48 1667.82 169.49	-2.32	172.35
160 236 0.19 0.00 0.07 -0.01 0.209 0.000 -0.070 -0.004 -5.25 -2.82 1670.06 175.32	-2.58	178.43

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 76 ((Os)															
161 162 163	237 238	0.19 0.19	0.00 0.00 0.00	0.08	-0.01 -0.01 -0.02	0.210	0.000	-0.082 -0.082 -0.084	-0.006 -0.006 0.004	-6.39	-3.66	1670.77 1672.67 1672.89	182.67 188.84 196.69			-3.16 -3.32 -3.63	186.04 192.41 200.48
164 165	241	0.17	0.00	0.08	-0.02 -0.03	0.187	0.000	-0.084 -0.086	0.015	-6.59	-4.16	1674.27 1674.32	203.39 211.41			-3.44 -3.67	215.69
166 167 168 169 170	243 244 245	0.17 0.15	0.00 0.00 0.00 0.00	0.09 0.08 0.08	-0.03 -0.04 -0.03 -0.03 -0.04	0.187 0.164 0.164	0.000 0.000 0.000	-0.098 -0.099 -0.089 -0.091	0.013 0.023 0.017 0.017 0.027	-7.01 -6.19 -6.52	-4.19 -3.87 -4.20	1675.37 1675.29 1676.19 1675.92 1677.14	218.43 226.58 233.76 242.09 248.95			-3.22 -3.44 -3.31 -3.65 -3.61	223.03 231.52 238.71 247.26 254.53
171 172 173 174	247 248 249 250	0.14 0.12 0.12	0.00 0.00 0.00 0.00	0.08 0.07 0.07 0.07	-0.04 -0.03 -0.03 -0.04	0.153 0.130 0.130	0.000 0.000 0.000 0.000	-0.091 -0.080 -0.080 -0.080	0.027 0.027 0.021 0.021 0.030 0.012	-7.07 -6.61 -7.20 -7.41	-4.87 -4.78 -5.37 -5.63	1677.14 1676.91 1677.71 1677.40 1678.42 1677.23	257.25 264.52 272.90 279.95 289.21			-4.12 -4.25 -4.84 -4.90 -5.44	263.06 270.33 278.95 286.44 295.26
176	252	-0.12 -0.12 -0.11	0.00	0.02 0.03 0.04	0.00	-0.125 -0.115	0.000	-0.029	0.004	-6.75	-5.72	1678.06 1677.66	296.45 304.92			-5.67 -6.39	302.75 311.54
\boldsymbol{z}	= 77 ((Ir)															
86 87 88		0.11		0.00 -0.01 0.00 0.00 0.00		0.118			0.010	-4.76 -3.92 -3.17	-3.92 -2.68 -1.90						-0.86 -4.91 -6.89 -10.80 -12.89
91	167 168 169	0.13 0.13	0.00 0.00 0.00	0.00 0.01 0.01	0.00 0.00 0.01	0.140 0.140	0.000 0.000	0.007 -0.005 -0.003	$0.000 \\ -0.001$	-2.04 -1.59 -1.23	$-0.68 \\ -0.22$	1304.68 1314.50 1325.80	-17.01 -18.76		0.019 0.026	$-0.70 \\ -0.24$	-16.53 -18.34 -21.63
94	170 171 172	0.15	0.00 0.00 0.00	0.01 0.02 0.02	0.00 0.00 0.00	0.162	0.000	-0.003 -0.015 -0.013	-0.003	-0.88 -0.65 -0.52	0.88	1335.26 1346.30 1355.49	-26.34	-26.43	0.040	0.86	-23.09 -26.11 -27.30
96 97 98	172 173 174 175 176	0.16 0.17 0.18	0.00 0.00 0.00 0.00	0.02 0.02 0.01 0.02 0.01	0.00 0.00 0.00 0.00	0.173 0.184 0.195		-0.013 0.000 -0.010	-0.003 -0.001 -0.003	-0.32 -0.36 -0.33 -0.44 -0.93	1.23 0.98 1.03	1366.23 1375.47 1385.88 1394.52	-30.14 -31.31 -33.63	-30.87 -33.43	0.014 0.028 0.020 0.020	1.21 0.96 1.02	-30.02 -31.25 -33.63 -34.27
100 101 102	178 179	0.22 0.19	0.00 0.00 0.00	0.02 0.02 0.03	0.00 0.00 0.00	0.240 0.207	$0.000 \\ 0.000$	$-0.004 \\ -0.021$	-0.004 -0.004 -0.006	-1.23 -1.14	0.81 0.60	1404.59 1412.94 1422.80	-36.49 -38.28	-36.25 -38.08	0.020 0.020 0.011	0.78 0.59	-36.30 -36.64 -38.45
103 104 105	181	0.19	0.00 0.00 0.00	0.03 0.04 0.05	0.00 0.00 -0.01	0.207	0.000	-0.033	-0.006 -0.008 -0.002	-1.91	0.03	1430.87 1440.47 1448.23	-39.80	-39.47	0.022 0.026 0.021	0.03	-38.50 -40.05 -39.78
106 107 108 109	184 185	0.19 0.19	0.00 0.00 0.00 0.00	0.06 0.06	-0.01 -0.01 -0.01 -0.02	0.208 0.208	$0.000 \\ 0.000$	-0.058	$-0.002 \\ -0.002$	-3.53 -3.67	-1.10 -1.26	1457.53 1465.06 1473.75 1480.72	-40.17 -40.80	-39.61 -40.34	0.025 0.028 0.028 0.017	-1.09 -1.24	-41.03 -40.51 -41.16 -40.07
110 111 112	188 189	0.18 0.17	0.00 0.00 0.00	0.07 0.07	-0.02 -0.02 -0.02	0.198 0.186	$0.000 \\ 0.000$	-0.072 -0.072 -0.074	0.006 0.007	-4.54 -4.53	-1.94 -1.69	1489.03 1495.79 1503.38	-38.62 -38.14	-38.33 -38.45	0.006 0.007 0.013	-1.62	-39.03 -38.55
113 114 115	191 192	0.15 0.15	0.00 0.00 0.00	0.07 0.07	-0.02 -0.03 -0.03	0.164 0.164	0.000	-0.064 -0.077 -0.077	0.018 0.018	-5.32 -5.99	-2.52 -3.15	1509.93 1517.82 1524.23	-36.44 -34.78	-36.71 -34.83	0.002	-2.41 -3.04	-37.06 -36.84 -35.19
116 117 118 119	194 195	0.14 0.13	0.00 0.00 0.00 0.00	0.07 0.06	-0.02 -0.03 -0.03 -0.02	0.153 0.141	0.000 0.000	-0.066 -0.078 -0.067 -0.056	0.019 0.021	-7.12 -7.21	-4.31 -4.76	1531.87 1538.04 1545.38 1551.04	-32.45 -31.71	-32.53 -31.69	0.002 0.002 0.002 0.038	-4.18 -4.64	-34.80 -32.86 -32.13 -29.77
121 122	198 199	-0.12 -0.11 -0.08 -0.07	0.00	0.02 0.02 0.02 0.02	$0.00 \\ 0.00$	-0.125 -0.115 -0.084 -0.073	$0.000 \\ 0.000$	$-0.018 \\ -0.021$	0.002 0.002	-7.59 -7.93	-6.43 -7.01	1557.95 1563.66 1570.52 1576.00	-25.78 -24.57		0.020 0.041	-6.42 -7.00	-28.66 -26.31 -25.09 -22.48

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 77 ((Ir)															
124		-0.06	0.00	0.03	0.01	-0.063	0.000	-0.033	-0.007	-9.56	-8.44	1582.53	-20.44			-8.41	-20.90
125	202	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-10.15		1587.49					-17.80
	203	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-10.49		1593.50					-15.72
	204 205	-0.01 0.00		0.00 0.00	0.00 0.00	-0.011 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-9.50 -8.43		1596.63 1601.03	-10.33 -6.65			-8.47 -7.42	-10.76 -7.05
	206	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000	-7.17		1603.72	-1.27			-6.33	-1.64
	207	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-7.17 -5.92		1607.65	2.87			-5.08	2.54
	208	0.01		0.00	0.00	0.011	0.000	0.000	0.000	-4.78		1610.09	8.50			-4.00	8.21
	209	-0.04		0.00	0.00		0.000	0.001	0.000	-3.70		1614.11	12.56			-3.09	12.31
	210					-0.063	0.000	0.013	-0.001	-2.86		1616.53	18.20			-2.23	18.01
134				-0.02	-0.01		-0.028	0.027	0.013	-2.45		1620.26	22.55			-1.25	22.44
	212 213			-0.02 -0.02	-0.01 0.00		-0.042 -0.041	0.029	0.014 0.004	-2.16 -1.53		1622.84 1626.62	28.04 32.33			-0.78 -0.16	28.00 32.33
	214			-0.02	0.00		-0.014	0.029	0.003	-1.02		1629.10	37.92			0.15	37.97
138	215	0.11	0.00	-0.02	0.00	0.118	0.000	0.029	0.003	-0.50	0.60	1632.82	42.28			0.62	42.39
139	216	0.13	0.00	-0.03	0.00	0.139	0.000	0.044	0.006	-0.70	0.80	1635.20	47.97			0.84	48.17
	217			-0.03	0.00	0.150	0.000	0.045	0.006	-0.52		1638.86	52.38			1.14	52.67
	218			-0.03	0.00	0.172	0.000	0.048	0.007	-0.82		1641.23 1644.96	58.08			1.12	58.45
	219 220			-0.03 -0.03	0.00 0.00	0.172 0.194	0.000 0.000	0.048 0.051	0.007 0.008	-0.67 -1.11		1647.30	62.41 68.15			1.11 0.90	62.87 68.69
	221			-0.03	0.01	0.205	0.000		-0.001	-1.12		1650.72	72.80			1.00	73.44
	222			-0.02	0.01	0.205	0.000		-0.004	-1.26		1652.91	78.68			0.69	79.38
146	223	0.19	0.00	-0.01	0.01	0.205	0.000	0.028	-0.006	-1.09		1656.15	83.52			0.74	84.31
	224			-0.01	0.01	0.238	0.000		-0.005	-1.88		1658.28	89.46			0.31	90.34
	225	0.22		0.00	0.01	0.239	0.000		-0.008	-1.87		1661.43	94.38			0.24	95.37
	226	0.22 0.22		0.00	0.01	0.239	0.000 0.000		-0.008 -0.011	-2.38		1663.41 1666.39	100.47			-0.24	101.56 106.78
	227 228	0.22		0.01 0.02	0.01	0.239 0.240	0.000	-0.002		-2.42 -2.92		1668.16	105.56 111.86			-0.34 -0.78	106.78
	229	0.22		0.02	0.01	0.240		-0.002		-2.82		1670.77	117.32			-0.71	118.80
153	230	0.22	0.00	0.03	0.01	0.241	0.000	-0.014	-0.016	-3.17	-1.03	1672.20	123.97			-1.00	125.59
	231	0.22		0.03	0.01	0.241		-0.014		-2.98		1674.53	129.70			-0.85	131.47
	232	0.22		0.04	0.00	0.241		-0.028		-3.30		1675.69	136.61			-1.09	138.50
	233 234	0.20 0.20		0.04 0.05	0.00 0.00	0.219 0.219		-0.031 -0.043		-3.04		1677.96 1679.18	142.42			-1.05	144.48 151.51
	235	0.20		0.05	0.00	0.219		-0.045				1681.35					157.58
	236	0.19			-0.01	0.208		-0.058		-4.42	-2.19	1682.49	162.10			-2.05	164.72
	237	0.18			-0.01	0.197		-0.059				1684.64	168.02			-2.26	170.82
	238	0.18			-0.01	0.198		-0.071				1685.68	175.05			-2.84	178.08
	239	0.18			-0.01	0.198		-0.071				1687.61	181.20			-3.02	184.40
	240	0.18			-0.02	0.198		-0.084	0.004	-6.33		1688.30	188.57			-3.36	192.07
	241 242	0.17 0.17			-0.02 -0.02	0.187 0.187		-0.085 -0.085	0.005 0.005	-6.10 -6.29		1689.78 1689.87	195.16 203.15			-3.25 -3.27	198.87 207.04
	243	0.17			-0.02 -0.03	0.137		-0.083 -0.088	0.003	-6.29 -6.08		1691.21	209.88			-3.27 -3.10	214.08
	244	0.15			-0.03	0.164		-0.089	0.017			1691.46	217.70			-3.42	222.11
168	245	0.15	0.00	0.08	-0.03	0.164	0.000	-0.089	0.017	-6.17	-3.82	1692.57	224.66			-3.30	229.29
169	246	0.14	0.00	0.07	-0.03	0.153	0.000	-0.078	0.019	-6.15	-4.13	1692.62	232.68			-3.67	237.43
	247	0.12			-0.02	0.130		-0.067	0.012	-5.74		1693.65	239.72			-3.79	244.53
	248	0.12			-0.03	0.130		-0.080	0.021			1694.03	247.42			-4.37	252.64
	249 250	0.12 0.12			-0.03 -0.03	0.130 0.130		-0.080 -0.080	0.021 0.021			1695.13 1695.15	254.39 262.44			-4.55 -5.14	259.85 268.12
		-0.12				-0.125		-0.017	0.012			1695.68	269.98			-5.38	275.43
		-0.12		0.02		-0.125		-0.017	0.012			1695.71	278.02			-6.11	283.71
		-0.11		0.03		-0.115		-0.030	0.004			1696.55	285.25			-6.34	291.18
		-0.10		0.03		-0.105		-0.031	0.004			1696.45	293.42			-7.10	
		-0.10		0.04		-0.105		-0.042	0.005			1697.11	300.84			-7.23	307.32
179	256	-0.09	0.00	0.03	0.00	-0.094	0.000	-0.031	0.003	-8.54	-7.65	1696.42	309.60			-7.59	316.28

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 78 ((D4)															
		(Ft) -0.09	0.00	0.01	0.00	-0.094	0.000	-0.008	0.001	-4.50	-3.57	1271.23	-0.49			-3.58	0.37
		-0.10		0.00	0.00		0.000	0.004	-0.000	-3.57		1283.50	-4.68			-2.64	-3.90
	167		0.00	0.00	0.00	0.107	0.000	0.004	0.000	-2.70		1293.27	-6.38			-1.61	-5.68
	168 169		0.00 0.00	0.00	0.00	0.118 0.129	0.000 0.000	0.005	0.000 -0.010	-2.09 -1.64		1305.34 1315.16		-11.04	0.209	-0.96 -0.43	-9.75 -11.57
								-0.007						16 21	0.010		
	170 171		0.00 0.00	0.01	0.00	0.129 0.140	0.000 0.000	-0.006	-0.001	-1.07 -0.67		1326.89 1336.36			0.019 0.088		-15.30 -16.76
	172		0.00	0.01	0.00	0.140	0.000	-0.005		-0.31		1347.82			0.013		-20.21
	173		0.00	0.01	0.00	0.151	0.000	-0.004		-0.14		1357.03			0.056		-21.42
	174		0.00	0.01	0.00	0.162		-0.003		0.01		1368.20			0.012		-24.57
	175 176		0.00 0.00	0.01	0.00	0.173 0.239	0.000 0.000	-0.001 0.021	-0.001 0.002	0.10 -0.46		1377.10 1388.15			0.019 0.014		-25.47 -28.50
	170		0.00	0.00	0.00	0.259	0.000	0.021	0.002	-0.46 -0.73		1396.90			0.014		-28.30 -29.25
	178		0.00	0.01	0.00	0.250	0.000		-0.001	-0.71		1407.46			0.011		-31.77
101	179	0.23	0.00	0.01	0.00	0.250	0.000	0.011	-0.001	-0.94	1.07	1415.92	-32.17	-32.26	0.009	1.05	-32.22
	180		0.00	0.02	0.00	0.251	0.000	-0.002		-0.98		1426.08			0.011		-34.35
103	181 182		0.00 0.00	0.03	0.00	0.240 0.219		-0.016 -0.031		-1.27 -1.39		1434.25 1444.23			0.015 0.016		-34.49 -36.43
	183		0.00	0.04	0.00	0.219		-0.031 -0.030		-1.89		1452.07			0.016		-36.45 -36.25
	184		0.00		-0.01	0.219		-0.044		-2.28		1461.76			0.018		-37.89
107	185	0.20	0.00	0.05	-0.01	0.219	0.000	-0.044	-0.001	-2.70	-0.54	1469.32	-37.15	-36.68	0.041	-0.54	-37.42
	186		0.00		-0.01	0.208		-0.058		-2.96		1478.45			0.022		-38.49
	187 188		0.00 0.00		-0.01 -0.01	0.208 0.186		-0.058 -0.061		-3.18 -3.09		1485.43 1494.15			0.028 0.005		-37.44 -38.10
	189		0.00		-0.01	0.186		-0.061 -0.062		-3.09 -3.34		1500.91			0.003		-36.10 -36.81
112			0.00		-0.01	0.163		-0.051	0.002	-3.37		1509.30			0.006		-37.17
	191		0.00		-0.01	0.152		-0.052	0.002	-3.89		1515.99			0.004		-35.80
114			0.00		-0.01	0.141		-0.054	0.003	-4.31		1524.44			0.002		-36.20
115 116			0.00 0.00		-0.01 -0.02	0.141 0.130		-0.054 -0.055	0.003	-4.93 -5.43		1530.86 1539.03			0.002 0.001		-34.56 -34.65
									0.013			1545.18					
117 118			0.00 0.00		-0.02 -0.02	0.130 0.119		-0.055 -0.056	0.013 0.014	-6.10 -6.63		1543.18			0.001 0.001		-32.74 -32.58
		-0.12			-0.01			-0.017	0.012	-6.86		1559.17			0.001		-30.64
		-0.11				-0.115		-0.018	0.012	-7.46		1566.87			0.003		-30.27
		-0.11		0.02		-0.115		-0.018	0.002	-8.28		1572.62			0.003		-27.97
		-0.08 -0.07		0.03		-0.084 -0.073		-0.032 -0.033		-8.85 -9.77		1580.00 1585.53			0.020 0.050		-27.25 -24.69
		-0.07 -0.06		0.03		-0.073 -0.063	0.000	-0.033 -0.033	-0.007 -0.007			1592.46		-23.74	0.030		-24.09 -23.54
	203		0.00	0.00	0.00	0.000	0.000	0.000		-10.90		1597.43					-20.46
126	204	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-11.23	-10.06	1603.85	-18.33			-10.06	-18.79
	205	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000	-10.23		1607.04					-13.88
	206 207		0.00 0.00	0.00	0.00	0.000	0.000 0.000	0.000 0.000	0.000 0.000	-9.15 -7.88		1611.82 1614.54	-10.15 -4.80			-8.09 -6.98	-10.57 -5.19
	208		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.63		1618.87	-1.06			-5.72	-3.19 -1.42
	209		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-5.48		1621.34	4.54			-4.63	4.21
132	210	-0.04	0.00	0.00	0.00	-0.042	0.000	0.001	0.000	-4.41	-3.72	1625.76	8.19			-3.72	7.91
		-0.05		0.00	0.00		0.000	0.001	0.000	-3.51		1628.21	13.81			-2.85	13.57
	212 213	-0.06		0.00 -0.02	0.00		0.000 -0.055	0.001 0.028	0.000 0.004	-2.61 -2.59		1632.41 1634.73	17.69 23.44			-1.98 -1.18	17.49 23.33
	213			-0.02 -0.02	0.00		-0.033 -0.041	0.028	0.004	-2.39 -1.73		1638.88	27.35			-0.52	27.29
	215			-0.03	0.00		-0.041	0.042	0.005	-1.60		1641.30	33.01			-0.08	33.02
	216	0.11	0.00	-0.02	0.00	0.118	0.000	0.029	0.003	-0.72		1645.38	37.01			0.40	37.05
	217			-0.03	0.00	0.118	0.000	0.042	0.005	-0.59		1647.71	42.74			0.68	42.87
	218 219			-0.03 -0.04	0.00	0.139 0.172	0.000 0.000	0.044 0.060	0.006	-0.42 -1.01		1651.67 1654.01	46.85 52.59			1.08 1.16	47.06 52.90
	220			-0.04	0.00	0.172	0.000	0.062	0.009	-0.94		1658.11	56.56			1.19	56.96
	220			-0.04 -0.04	0.00	0.183	0.000	0.062	0.010	-0.94 -1.24		1660.42	62.32			1.19	50.90 62.79

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 78	(Pt)															
144		` ′	0.00	-0.03	0.01	0.205	0.000	0.053	-0.001	-0.96	1.05	1664.20	66.61			1.12	67.15
145	223			-0.03	0.01		0.000			-1.26	0.79	1666.41	72.47			0.84	73.09
	224			-0.02	0.01		0.000			-1.12		1670.00	76.95			0.91	77.64
147				-0.02	0.02		0.000		-0.012			1672.17	82.86			0.51	83.68
148				-0.01	0.02		0.000		-0.015			1675.68	87.42			0.46	88.34
149			0.00	0.00	0.01		0.000			-2.09		1677.62	93.55			-0.01	94.51
150 151		0.22	0.00	0.01 0.01	0.01		0.000 0.000			-2.10 -2.54		1680.93 1682.69	98.31 104.62			-0.06 -0.49	99.39 105.81
152		0.22		0.01	0.01		0.000		-0.011 -0.013			1685.67	104.02			-0.49 -0.41	111.04
153		0.22		0.02	0.01				-0.013			1687.04	116.42			-0.64	117.86
154	232	0.22		0.03	0.01	0.241	0.000	-0.014	-0.016	-2 56	-0.53	1689.76	121.77			-0.48	123.37
155		0.22		0.03	0.00				-0.009			1690.93	128.66			-0.71	130.38
156	234	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-2.44	-0.66	1693.49	134.17			-0.60	136.05
157	235	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-2.85	-1.07	1694.68	141.06			-1.02	143.07
158	236	0.19	0.00	0.05	0.00	0.208	0.000	-0.045	-0.010	-3.12	-1.17	1697.24	146.57			-1.06	148.78
159	237	0.19	0.00	0.06	-0.01	0.208	0.000	-0.058	-0.002	-3.89	-1.72	1698.38	153.50			-1.57	155.90
	238		0.00		-0.01			-0.059				1700.86	159.09			-1.76	161.66
161			0.00		-0.01				-0.004				166.12			-2.32	168.92
162			0.00		-0.01			-0.071 -0.072	-0.004			1704.17	171.93			-2.47	174.90
163			0.00		-0.01								179.42			-2.80	182.57
164			0.00		-0.02			-0.074 -0.075		-5.13		1706.57	185.66			-2.66	189.03 197.14
165 166			0.00		-0.02 -0.02			-0.073 -0.088	0.008			1706.72 1708.40	193.59 199.98			-2.72 -2.55	203.82
167		0.15			-0.02			-0.089	0.007	-5.75		1708.73	207.72			-2.86	211.85
168			0.00		-0.02			-0.066				1710.02	214.50			-2.81	218.59
169		0.12	0.00	0.06	-0.02	0.130	0.000	-0.067	0.012			1710.33	222.26			-3.36	226.55
	248					-0.135			0.011			1711.78	228.89			-3.65	233.12
171	249	-0.13				-0.135			0.011			1712.09	236.64			-4.37	241.08
		-0.13				-0.135			0.011			1713.66	243.15			-4.68	247.80
173	251	-0.12	0.00	0.02	-0.01	-0.125	0.000	-0.017	0.012	-6.54	-5.50	1713.90	250.98			-5.45	255.87
		-0.12		0.02		-0.125			0.012			1715.25	257.70			-5.71	262.81
		-0.12		0.03		-0.125			0.004	-7.55		1715.27	265.75			-6.43	271.09
		-0.10		0.03		-0.105 -0.105						1716.57	272.52			-6.78	278.10
		-0.10 -0.10		0.04		-0.105 -0.105						1716.50 1717.44					286.53 293.91
		-0.09															
		-0.09 -0.07		0.04		-0.094						1716.79 1717.43					302.87 310.59
		-0.07		0.04								1717.43					319.54
		0.00		0.00	0.00		0.000	0.000				1717.00					327.53
\boldsymbol{z}	= 79	(An)															
		-0.08	0.00	0.01	0.00	-0.084	0.000	-0.009	0.001	-4.81	-3.89	1281.85	4.26			-3.90	5.20
		-0.10		0.01		-0.105						1292.22	1.96			-2.96	2.82
90	169	-0.10	0.00	0.01	0.00	-0.105	0.000	-0.008	0.001	-3.14	-2.15	1304.21	-1.96			-2.16	-1.18
		-0.10		0.01		-0.105						1314.18	-3.86			-1.29	-3.15
92	171	-0.11	0.00	0.02	0.00	-0.115	0.000	-0.018	0.002	-1.79	-0.70	1325.93	-7.54	-7.57	0.026	-0.71	-6.90
93	172	0.11	0.00	0.01	0.00	0.118	0.000	-0.007	-0.001	-1.28	-0.22	1335.84	-9.38			-0.23	-8.82
	173		0.00	0.01	0.00				-0.001				-12.78	-12.82	0.026		-12.29
	174		0.00	0.01	0.00				-0.001			1356.93		17 44	0.042		-13.90
	175 176		0.00	0.01 0.01	0.00				-0.001 -0.001			1368.08	-17.41	-1/.44	0.042		-17.04 -18.37
														21.55	0.012		
	177 178		0.00	0.01	0.00		0.000	-0.005 0.021		0.03 -0.69			-21.47 -22.45		0.013 0.057		-21.23 -22.29
	178		0.00	0.00	0.00		0.000	0.021		-0.69 -0.67			-22.45 -24.96		0.057		-22.29 -24.84
101			0.00	0.00	0.00		0.000		-0.002				-24.90 -25.63		0.017		-24.64 -25.58
102			0.00	0.02	0.00		0.000		-0.004				-27.82		0.020		-27.82
103			0.00	0.03	0.00				-0.006				-28.38		0.020		-28.43
	183		0.00		-0.01				0.004				-30.20		0.010		-30.27

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	70.4	(
	= 79 (184		0.00	0.04	0.00	0.252	0.000	-0.026	-0.009	-1.75	0.39	1453.84	-30.52	-30.32	0.022	0.37	-30.66
	185		0.00	0.04	-0.01	0.218		-0.032	0.002	-1.72		1463.45			0.026		-32.22
	186		0.00	0.04	-0.01	0.218		-0.032	0.002	-2.08		1471.46			0.021		-32.21
		-0.15 -0.15		0.02 0.01		-0.156 -0.156		-0.014 -0.003	0.003	-1.59 -1.92		1480.54 1488.06			0.025 0.020		-33.25 -32.74
		-0.15		0.02		-0.156		-0.014	0.003	-2.35		1497.10			0.020		-33.74
111	190	-0.14	0.00	0.02		-0.146		-0.015	0.003	-2.78		1504.48			0.016		-33.08
		-0.14		0.02		-0.146		-0.015	0.003	-3.26		1513.38			0.037		-33.92
		-0.14 -0.12		0.03 0.02		-0.146 -0.125		-0.026 -0.017	0.004 0.003	-3.97 -4.30		1520.54 1529.10			0.016 0.011		-33.04 -33.55
		-0.12		0.03		-0.125		-0.029	0.004	-5.04		1535.97			0.010		-32.37
		-0.12		0.03		-0.125		-0.029	0.004	-5.55		1544.16			0.001		-32.49
		-0.12		0.03		-0.125		-0.029	0.004	-6.30		1551.00			0.003		-31.28
		-0.12 -0.11		0.02		-0.125 -0.115		-0.017 -0.018	0.012 0.002	-6.94 -7.61		1559.07 1565.49			0.001		-31.29 -29.66
		-0.11		0.02		-0.115		-0.018	0.012	-8.33		1573.23			0.001		-29.31
121		-0.09		0.02		-0.094		-0.020	0.002	-9.07		1579.51			0.050		-27.53
		-0.08		0.03		-0.084		-0.032	-0.007	-9.78		1586.88			0.003		-26.82
		-0.07 -0.06		0.03 0.03		-0.073 -0.063	0.000 0.000	-0.033 -0.033	-0.007 -0.007			1592.79 1599.79			0.166 0.003	-9.47 -10.00	-24.66 -23.58
	204		0.00	0.00	0.00	0.000	0.000	0.000				1605.25		2011 .	0.002		-20.98
	205		0.00	0.00	0.00	0.000	0.000	0.000				1611.70					-19.34
	206	-0.02		0.00	0.00	-0.021	0.000	0.000				1615.30					-14.85
	207 208		0.00 0.00	0.00	0.00	0.000 0.011	0.000 0.000	0.000 0.000	0.000	-10.10 -8.82		1620.11 1623.12	-11.15 -6.09			-8.99 -7.76	-11.58 -6.49
	209		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-7.59		1627.58	-2.48			-6.59	-2.85
	210		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-6.45		1630.47	2.70			-5.51	2.35
	211		0.00	0.00	0.00	0.021	0.000	0.000	0.000	-5.32		1634.77	6.47			-4.45	6.16
	212 213	-0.04	0.00	0.00	0.00	0.043 -0.052	0.000 0.000	0.001	0.000 0.000	-4.38 -3.45		1637.74 1641.94	11.57 15.44			-3.70 -2.79	11.30 15.21
	214			-0.02	0.00		-0.055	0.027	0.003	-3.24		1644.58	20.87			-1.92	20.71
	215			-0.02	0.00		-0.055	0.027	0.003	-2.54		1648.74	24.79			-1.22	24.68
	216			-0.02	0.00		-0.055	0.028	0.004	-2.05		1651.46	30.14			-0.71	30.08
	217 218			-0.02 -0.03	0.00	0.107	-0.041 0.000	0.029 0.042	0.004 0.005	-1.38 -1.07		1655.53 1658.18	34.14 39.57			-0.17 0.20	34.13 39.62
	219			-0.03	0.00	0.118	0.000	0.042	0.005	-0.63		1662.14	43.67			0.61	43.80
	220			-0.05	0.00	0.161	0.000	0.071	0.011	-1.47		1664.72	49.17			0.88	49.43
	221			-0.04	0.00	0.172	0.000	0.060	0.009	-1.04		1668.62	53.34			1.09	53.64
	222 223			-0.04 -0.04	0.00	0.183 0.194	0.000 0.000	0.062 0.064	0.010 0.001	-1.30 -1.23		1671.45 1675.22	58.58 62.88			0.80 0.96	58.95 63.34
	224			-0.03	0.01	0.205	0.000		-0.001	-1.38		1677.80	68.37			0.68	68.88
	225			-0.03	0.01	0.205	0.000		-0.001	-1.26		1681.39	72.85			0.79	73.45
	226			-0.02	0.01	0.216	0.000		-0.003	-1.54		1683.81	78.51			0.46	79.16
	227 228		0.00 0.00	-0.01 0.00	0.02	0.238 0.239	0.000 0.000		-0.015 -0.018	-1.74 -2.15		1687.36 1689.70	83.03 88.75			0.43 -0.02	83.82 89.63
	229		0.00	0.00	0.02	0.239	0.000		-0.018	-2.18		1693.03	93.49			-0.02	94.48
	230		0.00	0.01	0.02	0.240	0.000		-0.021	-2.62		1695.18	99.42			-0.50	100.52
	231		0.00	0.02	0.01	0.240	0.000	-0.002		-2.40		1698.09	104.57			-0.39	105.74
	232233		0.00 0.00	0.02 0.03	0.01 0.01	0.240 0.241		-0.002 -0.014		-2.60 -2.47		1699.83 1702.54	110.91 116.28			-0.62 -0.43	112.19 117.71
	234		0.00	0.03	0.01	0.241		-0.014 -0.014		-2.47 -2.65		1702.34	122.83			-0.43 -0.63	124.37
	235		0.00	0.03	0.00	0.241		-0.014 -0.021		-2.03 -2.11		1704.00	128.40			-0.03 -0.48	130.06
157	236	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-2.63	-0.90	1708.10	134.93			-0.86	136.74
	237 238		0.00	0.04	$0.00 \\ -0.01$	0.196 0.208		-0.034 -0.046		-2.59 -3.39		1710.63	140.47			-0.90 -1.41	
	239		0.00		-0.01	0.208		-0.040 -0.058		-3.80		1712.12 1714.60	147.04				149.18 154.99
	239		0.00		-0.01 -0.01	0.208		-0.058 -0.059		-3.80 -4.24		1714.60				-1.55 -2.05	154.99
						'											

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 79	(A11)															
	241	` ′	0.00	0.07	-0.01	0.209	0.000	-0.070	-0.004	-4.77	-2.40	1718.21	165.18			-2.19	167.90
163	242				-0.02	0.198	0.000	-0.072	0.006	-5.03		1719.16	172.29			-2.50	175.22
	243				-0.02			-0.074	0.007	-4.75		1720.97	178.55			-2.36	181.67
	244				-0.02			-0.075	0.008	-4.91		1721.45	186.15			-2.39	189.44
	245				-0.01			-0.054	0.003	-3.92		1722.93	192.73			-2.27	196.05
	246 247				-0.01 -0.01			-0.054	0.003	-4.41 -4.29		1723.69 1725.54	200.05 206.27			-2.76 -3.14	203.55 209.84
						-0.135 -0.135			0.011	-4.29 -4.98		1725.34	213.52			-3.14 -3.87	217.27
						-0.135			0.011	-5.38		1728.19	219.77			-4.27	223.71
171	250	-0.13	0.00	0.01	-0.01	-0.135	0.000	-0.004	0.011	-6.10	-4.99	1728.83	227.20			-4.97	231.34
172	251	-0.12	0.00	0.01	-0.02	-0.125	0.000	-0.005	0.020	-6.42	-5.41	1730.51	233.59			-5.30	238.02
						-0.125			0.012	-7.14		1730.98	241.19			-6.05	245.77
						-0.125 -0.105			0.012 0.012	-7.36 -8.01		1732.32 1732.76	247.92 255.55			-6.29 -7.09	252.71 260.57
		-0.10				-0.105 -0.105			0.012	-8.40		1734.01	262.37			-7.09 -7.39	267.61
		-0.10				-0.105			0.005	-9.30		1734.26	270.19			-8.10	275.71
		-0.10				-0.105			0.005	-9.43		1735.18	277.34			-8.23	283.10
179	258	-0.08	0.00	0.03	0.00	-0.084	0.000	-0.032	0.003	-9.60	-8.67	1734.85	285.74			-8.61	291.68
		-0.07				-0.073			-0.006	-9.76		1735.55	293.12			-8.58	299.38
		-0.07			0.01			-0.033	-0.007	-10.11		1735.18	301.55			-9.08	308.01
	261		0.00		0.00		0.000	0.000	0.000	-9.97		1735.54	309.27			-9.02	315.89
	262 263	-0.01	0.00		0.00	-0.011	0.000	0.000		-10.72 -10.73			317.57 325.29			-9.73 -9.73	324.45 332.43
			0.00	0.00	0.00	0.000	0.000	0.000	0.000	10.75	7.13	1733.00	323.27			7.13	332.43
	= 80	_	0.00	0.02	0.00	0.004	0.000	0.020	0.002	2.71	2.67	1204 17	5 27			2.60	6.22
		-0.09 -0.10				-0.094 -0.105			0.002 -0.007	-3.71 -2.97		1304.17 1314.29	5.37 3.32			-2.68 -1.89	6.32 4.19
		-0.10				-0.105			0.007	-2.26		1326.44	-0.76	-1.09	0.209	-1.22	0.04
		-0.10			0.00	-0.105	0.000	-0.019	0.002	-1.59		1336.25	-2.50			-0.56	-1.78
94	174	-0.10	0.00	0.02	0.00	-0.105	0.000	-0.019	0.002	-1.10	-0.08	1348.14	-6.32	-6.65	0.020	-0.09	-5.67
		-0.11				-0.115			0.004	-0.77		1357.69	-7.79	-7.99	0.101	0.39	-7.22
		-0.11				-0.115			0.004	-0.42		1369.28		-11.78	0.014		-10.81
		-0.11 -0.12				-0.115 -0.125			-0.007 0.003	-0.06 0.09		1378.64 1389.95			0.075 0.013		-12.16 -15.46
		-0.12				-0.135				0.15		1399.01			0.027		-16.52
		-0.13				-0.135				0.23		1410.05			0.014		-19.54
101	181	-0.14	0.00	0.01	0.01	-0.146	0.000	-0.004	-0.008	0.15		1418.84			0.015		-20.33
		-0.14				-0.146			0.001	0.00		1429.67			0.010		-23.14
		-0.14				-0.146			-0.008	-0.11		1438.17			0.008		-23.62
		-0.14				-0.146			0.001	-0.39		1448.73			0.010		-26.16
		-0.14 -0.14				-0.146 -0.146			0.001	-0.62 -0.93		1456.98 1467.18			0.016 0.011		-26.40 -28.56
		-0.14				-0.146			0.001	-1.24		1475.11			0.011		-28.47
		-0.14				-0.146			0.003			1485.00			0.012	-0.38	-30.33
109	189	-0.14	0.00	0.02	0.00	-0.146	0.000	-0.015	0.003	-1.94	-0.70	1492.64	-29.75	-29.63	0.033	-0.70	-29.93
		-0.12				-0.125			0.003	-2.25		1502.28			0.016		-31.53
		-0.12				-0.125			0.004	-2.79		1509.65			0.023		-30.87
		-0.12 -0.12				-0.125 -0.125			0.004			1518.99 1526.15				-2.12 -2.64	
		-0.12 -0.12				-0.125 -0.125			0.004			1526.15				-2.64 -3.23	
		-0.12				-0.125			0.004	-5.18		1542.16			0.023		-31.20
		-0.12 -0.11				-0.125 -0.115			0.004			1550.99			0.023		-31.20 -31.98
		-0.12				-0.125			0.004			1557.69			0.003	-5.27	-30.63
		-0.11				-0.115			0.002	-7.20		1566.23					-31.12
		-0.11				-0.115			0.004			1572.68			0.000		-29.50
		-0.09				-0.094			0.002			1580.91				-7.50	
		-0.08 -0.07				-0.084 -0.073			0.002 -0.007			1587.27 1595.12				-8.47 -9.12	-27.97 -27.74
144	202	0.07	0.00	0.03	0.01	0.073	0.000	0.055	0.007	10.51	J.1 1	1373.12	21.31	21.33	0.001	7.12	21.17

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	E ₆	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 80 ((Hg)															
		-0.07	0.00	0.03	0.01	-0.073	0.000	-0.033	-0.007	-11.24	-10.01	1601.09	-25.20	-25.27	0.002	-9.98	-25.64
124	204	-0.05		0.02	0.01		0.000	-0.022				1608.48				-10.49	
	205 206		0.00	0.00	0.00	0.000	0.000	0.000				1614.12 1620.99				-11.33 -11.60	
	206	-0.00	0.00	0.00	0.00	0.000 -0.011	0.000 0.000	0.000 0.000				1620.99				-11.60 -10.66	
	208		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-10.80		1629.88		10.22	0.120		-14.05
	209		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.48		1632.89	-8.57			-8.37	-8.97
130	210	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.27		1637.79	-5.40			-7.24	-5.79
131			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.09		1640.71	-0.25			-6.14	-0.60
	212		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.97		1645.41	3.12			-5.07	2.79
	213 214	-0.00	0.00	0.00	0.00	0.000 -0.042	0.000 0.000	0.000 0.001	0.000 0.000	-4.90 -3.97		1648.18 1652.85	8.42 11.82			-4.08 -3.24	8.12 11.56
	215		0.06		0.00			0.001	0.003	-3.88		1655.44	17.30			-3.24 -2.28	17.12
	216	0.06	0.05	-0.01	0.00		-0.068	0.014	0.002	-2.90		1659.96	20.85			-1.55	20.71
137	217	0.07	0.06	-0.02	0.00	0.076	-0.082	0.027	0.004	-2.66	-1.05	1662.70	26.19			-1.00	26.10
	218			-0.02	0.00		-0.069	0.028	0.004	-1.81		1667.10	29.86			-0.39	29.82
	219 220			-0.02 -0.03	0.00		-0.069	0.028	0.004	-1.37 -0.70		1669.68	35.35			0.06	35.37 39.26
	221			-0.05	0.00	0.107	-0.042 0.000	0.041 0.071	0.005	-0.70 -1.43		1673.92 1676.51	39.18 44.67			0.59 0.87	39.20 44.87
	222			-0.05	0.00	0.172	0.000	0.073	0.012	-1.30		1680.97	48.28			0.96	48.56
143	223	0.17	0.00	-0.04	0.00	0.183	0.000	0.062	0.010	-1.22	0.76	1683.62	53.70			0.84	54.00
	224			-0.04	0.01	0.194	0.000	0.064	0.001	-1.12		1687.74	57.65			1.03	58.03
	225			-0.04	0.01	0.205	0.000	0.065	0.001	-1.47		1690.30	63.16			0.82	63.61
	226 227			-0.03 -0.03	0.01 0.02	0.205 0.216	0.000 0.000	0.053	-0.001 -0.011	-1.08 -1.57		1694.25 1696.72	67.28 72.88			0.92 0.63	67.79 73.51
	228			-0.03			0.000		-0.011			1700.58	77.09				77.78
	229			-0.01	0.02	0.238 0.238	0.000		-0.015	-1.51 -1.99		1700.38	82.79			0.60 0.17	83.57
	230		0.00	0.00	0.02	0.239	0.000		-0.018	-1.92		1706.63	87.19			0.14	88.07
	231		0.00	0.01	0.02	0.240	0.000		-0.021	-2.31		1708.75	93.14			-0.24	94.12
152	232	0.22	0.00	0.01	0.02	0.240	0.000	0.011	-0.021	-2.14	-0.18	1712.06	97.90			-0.11	98.99
	233		0.00	0.02	0.01	0.240	0.000	-0.002		-2.23		1713.73	104.30			-0.30	105.44
	234 235		0.00 0.00	0.02 0.03	0.01 0.01	0.240 0.241	0.000	-0.002 -0.014		-1.97 -2.23		1716.76 1718.31	109.34 115.87			-0.09 -0.27	110.60 117.27
	236		0.00		0.00	0.218			-0.006			1721.14					122.60
	237		0.00		0.00	0.207	0.000	-0.033	-0.008	-2.13		1722.65					129.32
158	238	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-2.15	-0.51	1725.54	132.85			-0.46	134.64
	239		0.00	0.05	0.00	0.208		-0.045		-2.83		1727.00	139.46				141.42
	240 241		0.00		-0.01 -0.01	0.197 0.208		-0.047 -0.058	0.000	-2.87 -3.70		1729.75	144.78 151.52			-1.00	
	241		0.00 0.00		-0.01	0.208		-0.058 -0.059		-3.76		1731.08 1733.66	157.01			-1.60	153.82 159.48
	243		0.00		-0.01	0.187		-0.072		-4.31		1734.67	164.07				166.76
	244		0.00		-0.01	0.175		-0.062		-3.76		1736.81	170.00			-1.83	172.80
	245		0.00		-0.02	0.175		-0.063	0.009	-4.02		1737.34	177.54			-1.88	180.54
		-0.13		0.02		-0.136		-0.016	0.003	-3.39		1739.62	183.34			-2.26	
		-0.13		0.02		-0.136		-0.016	0.003	-4.03		1740.54	190.49			-2.90	
		-0.13 -0.13		0.01 0.01		-0.135 -0.135		-0.005 -0.005	0.001	-4.34 -5.05		1742.84 1743.66	196.26 203.51			-3.29 -4.00	199.54 206.97
		-0.13				-0.135		-0.003	0.001	-5.46		1745.82	209.42			-4.36	
171	251	-0.13	0.00			-0.135	0.000	-0.004	0.011	-6.17		1746.46	216.85			-5.05	
172	252	-0.12	0.00	0.02		-0.125	0.000	-0.017	0.012	-6.49	-5.45	1748.44	222.95			-5.40	227.04
		-0.12		0.02		-0.125		-0.017	0.003	-7.19		1748.94	230.52				234.77
		-0.10		0.02		-0.105		-0.019	0.002	-7.31		1750.66	236.87			-6.42	
		-0.10 -0.10		0.03		-0.105 -0.105		-0.031 -0.031	0.004 0.004	-8.22 -8.54		1751.11 1752.72	244.48 250.95				249.19 255.88
		-0.10		0.03		-0.105		-0.042	0.005	-9.45		1752.72	258.77			-8.23	263.96
		-0.10		0.04		-0.105		-0.042	0.005	-9.56		1754.21					271.02
		-0.08				-0.084		-0.032	0.003	-9.76		1753.91					279.57

2	N	A	ε_2	ε3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
No											(IVIE V)	(IVIEV)	(IVIE V)	(IVIE V)	(IVIE V)	(MEV)	(MEV)	(IVIEV)
18 26 000 000 000 000 000 000 0000 0000			_	0.00	0.04	0.01	0.072	0.000	0.044	0.006	0.04	0.05	1754.04	201.02			0.72	207.02
182 262 200 000																		
183 28 00 00 00 00 00 00 00																		302.86
185 265 -001 000 000 000 000 000 0000 0000 0000 0000 -0018 0-919 7575.96 322.55																		311.45
	184	264	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-11.06	-10.03	1755.88	312.36			-10.03	319.11
	185	265	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-10.18	-9.19	1753.96	322.35			-9.19	329.36
92 173 0.06 0.09 -0.01 0.00 0.064 0.006 0.004 0.001 -2.62 -1.79 3343 8.84 -1.84 1.89 1.89 1.79 1.79 1.79 1.79 1.79 1.79 1.79 1.7	186	266	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.39	-8.42	1753.73	330.65			-8.42	337.93
94 175 007 001 000 000 0075 -0.014 0.002 0.000 -1.96 -1.17 134467 6.37	\boldsymbol{z}	= 81 ((Tl)															
94 175	92	173	0.06	0.00	-0.01	0.00			0.014	0.001	-2.62			8.64			-1.80	9.60
95 176 0.07																		7.26
97 178 0.07 0.01 0.01 0.01 0.00 0.075 -0.014 -0.010 -0.001 -0.010																		3.31
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$															_3 33	0.025		
98 179 0.08 0.00 0.01 0.00 0.08 0.00 0.00 0.085 0.000 -0.009 -0.001 0.01 0.51 1389.46 -8.06 -8.30 0.043 0.06 0.79 -9.60 101 181 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.54 0.89 1409.98 1-12.84 -12.80 0.009 0.89 -12.61 11 182 -0.05 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.58 0.94 1419.19 -13.58 -13.55 0.076 0.94 -13.21 11 182 -0.05 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.58 0.94 1419.19 -13.58 -13.55 0.076 0.94 -13.21 11 182 -0.05 0.00 0.00 0.00 0.00 0.00 0.000															3.33	0.023		
99 180 0.03 0.03 0.00 0.00 0.032 -0.041 0.000 0.000 0.033 0.79 1398.94 -9.48 -12.44 -12.80 0.009 0.89 -12.14 101 182 -0.05 0.00 0.000															-8 30	0.043		-7.54
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $															0.50	0.015		-9.02
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	100	181	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.54	0.89	1409.98	-12.44	-12.80	0.009		-12.04
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	101	182	-0.05	0.00	0.00	0.00	-0.052	0.000	0.001	0.000	0.58	0.94	1419.19	-13.58	-13.35	0.076	0.94	-13.25
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	102	183	-0.08	0.00	0.00	0.00	-0.084	0.000	0.002	-0.000	0.36					0.010	0.91	-15.99
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	110	191	-0.08	0.00	0.01	0.00	-0.084	0.000	-0.009	0.001	-1.99	-1.41	1504.60	-26.34	-26.28	0.008	-1.41	-26.47
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	111	192	-0.08	0.00	0.01	0.00	-0.084	0.000	-0.009	0.001	-2.43	-1.82	1512.44	-26.12	-25.87	0.032	-1.83	-26.28
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$					0.01	0.00	-0.063	0.000	-0.010									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$										0.001	-8.10							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	121	202	-0.05	0.00	0.01	0.00	-0.053	0.000	-0.011	0.001	-9.85	-8.98	1592.74	-25.71	-25.98	0.015	-8.98	-26.12
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
125 206 0.00 0.00 0.00 0.000 0.000 0.000 -12.22 1620.91 -21.59 -22.25 0.001 -12.22 -22.05 126 207 0.00 0.00 0.000 0.000 0.000 0.000 -13.79 -12.47 1627.80 -20.41 -21.03 0.005 -12.47 -20.8 127 208 -0.01 0.00 0.00 0.000 0.000 0.000 0.000 -12.47 1627.80 -20.41 -21.03 0.005 -12.47 -20.8 127 208 -0.01 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -12.47 -22.25 0.012 -22.25 0.012 -23.41 -13.64 0.002 -11.51 -16.75 0.002 -11.51 -16.75 0.002 -11.51 -16.75 0.002 -11.51 -16.75 0.002 -11.51 -16.75 0.002 -11.51 -16.75 0.004 0.008 -0.000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
127 208 -0.01 0.00 0.00 0.00 -0.011 0.000 0.000 -12.75 -11.51 1631.80 -16.34 -16.75 0.002 -11.51 -16.75 128 209 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -11.71 -10.49 1637.14 -13.60 -13.64 0.008 -10.49 -14.00 129 210 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -9.16 -8.07 1645.48 -5.81 -8.07 -6.1 131 212 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -9.16 -8.07 1645.48 -5.81 -8.07 -6.1 131 212 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -7.98 -6.96 1648.79 -1.04 -6.96 -1.4 132 213 0.00 0.00 0.00 0.000																		
128 209 0.00 0.00 0.00 0.00 0.000 0.000 0.000 -11.71 -10.49 1637.14 -13.60 -13.64 0.008 -10.49 -14.00 129 210 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -10.38 -9.23 1640.57 -8.96 -9.25 0.012 -9.23 -9.3 130 211 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -9.16 -8.07 1645.48 -5.81 -8.07 -6.1 131 212 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -7.98 -6.96 1648.79 -1.04 -6.96 -1.4 132 213 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -6.85 -5.89 1653.53 2.29 -5.89 1.5 133 214 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -5.78 -4.89 1656.70 7.20 -4.89 6.8 134 215 0.00 0.00 0.00 0.000 0.000									0.000									
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																		
131 212 0.00 0.00 0.00 0.000 0.000 0.000 -7.98 -6.96 1648.79 -1.04 -6.96 -1.4 132 213 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -6.85 -5.89 1653.53 2.29 -5.89 1.9 133 214 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -5.78 -4.89 1656.70 7.20 -4.89 6.8 134 215 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -4.77 -3.93 1661.28 10.68 -3.93 10.4 135 216 0.02 0.05 -0.01 0.00 0.022 -0.068 0.013 0.002 -4.38 -3.07 1664.33 15.70 -3.04 15.4 136 217 0.03 0.06 0.00 0.033 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05	129	210												-8.96				-9.36
132 213 0.00 0.00 0.00 0.000 0.000 0.000 -6.85 -5.89 1653.53 2.29 -5.89 1.5 133 214 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -5.78 -4.89 1656.70 7.20 -4.89 6.8 134 215 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -4.77 -3.93 1661.28 10.68 -3.93 10.4 135 216 0.02 0.05 -0.01 0.00 0.022 -0.068 0.013 0.002 -4.38 -3.07 1664.33 15.70 -3.04 15.4 136 217 0.03 0.06 0.00 0.033 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219																		-6.18
133 214 0.00 0.00 0.000 0.000 0.000 0.000 0.000 -5.78 -4.89 1656.70 7.20 -4.89 6.8 134 215 0.00 0.00 0.000 0.000 0.000 0.000 -4.77 -3.93 1661.28 10.68 -3.93 10.4 135 216 0.02 0.05 -0.01 0.00 0.022 -0.068 0.013 0.002 -4.38 -3.07 1664.33 15.70 -3.04 15.4 136 217 0.03 0.06 0.00 0.00 0.033 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9	131	212						0.000		0.000							-6.96	-1.40
134 215 0.00 0.00 0.00 0.000 0.000 0.000 -4.77 -3.93 1661.28 10.68 -3.93 10.4 135 216 0.02 0.05 -0.01 0.00 0.022 -0.068 0.013 0.002 -4.38 -3.07 1664.33 15.70 -3.04 15.4 136 217 0.03 0.06 0.00 0.00 0.033 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9																		1.95
135 216 0.02 0.05 -0.01 0.00 0.022 -0.068 0.013 0.002 -4.38 -3.07 1664.33 15.70 -3.04 15.4 136 217 0.03 0.06 0.00 0.00 0.033 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9																		6.89
136 217 0.03 0.06 0.00 0.03 -0.081 0.002 0.002 -3.74 -2.27 1668.82 19.28 -2.23 19.1 137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9																		15.48
137 218 0.05 0.06 -0.01 0.00 0.055 -0.082 0.014 0.003 -3.13 -1.64 1671.86 24.32 -1.60 24.1 138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9																		19.11
138 219 0.06 0.05 -0.01 0.00 0.065 -0.068 0.014 0.002 -2.22 -0.98 1676.24 28.01 -0.95 27.9																		24.19
																		27.92
										-0.007							-0.46	33.10
140 221 0.07 0.05 -0.01 0.00 0.076 -0.068 0.015 0.003 -1.11 0.04 1683.44 36.95 0.07 36.9	140	221	0.07	0.05	-0.01	0.00	0.076	-0.068	0.015	0.003	-1.11	0.04	1683.44	36.95			0.07	36.95

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 81	(TI)															
	222	` '	0.00	-0.06	0.00	0.162	0.000	0.084	0.013	-2.07	0.47	1686.21	42.25			0.61	42.42
142	223			-0.05	0.00	0.172	0.000	0.073	0.012	-1.51	0.76	1690.48	46.05			0.87	46.26
	224			-0.05	0.00	0.172	0.000	0.073	0.012	-1.60		1693.68	50.93			0.64	51.19
144				-0.05	0.01	0.183	0.000	0.075	0.002	-1.41		1697.80	54.88			0.85	55.21
	226			-0.04	0.01	0.183	0.000		-0.000	-1.28		1700.67	60.08			0.69	60.44
146 147	227 228			-0.03 -0.03	0.01 0.02	0.205 0.216	0.000 0.000		-0.001 -0.011	-1.09 -1.60		1704.59 1707.44	64.23 69.46			0.85 0.55	64.65 69.97
	229			-0.03 -0.02	0.02	0.216	0.000		-0.011	-1.39		1707.44	73.68			0.58	74.27
	230			-0.01	0.02	0.238	0.000		-0.015	-1.97		1714.02	79.01			0.13	79.67
150	231	0.22	0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-1.88	0.08	1717.70	83.40			0.13	84.16
	232		0.00	0.00	0.02	0.239	0.000		-0.018	-2.27		1720.19	88.99			-0.25	89.83
	233		0.00	0.01	0.02	0.240	0.000		-0.021	-2.09		1723.51	93.73			-0.10	94.69
	234 235		0.00 0.00	0.02	0.01 0.01	0.240 0.240		-0.002 -0.002		-2.13 -1.87		1725.52 1728.57	99.80			-0.25 -0.04	100.81 105.94
	236		0.00	0.02	0.01	0.241		-0.002		-2.08		1730.44				-0.19	112.27
	237		0.00	0.02	0.01	0.206		-0.008		-1.48		1733.32				-0.03	117.56
	238		0.00	0.03	0.00	0.207		-0.021		-1.84		1735.17				-0.37	123.90
158	239	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	-1.88	-0.30	1737.95	127.72			-0.25	129.35
	240		0.00	0.04	0.00	0.207		-0.033		-2.41		1739.79					
	241		0.00	0.05	0.00	0.197		-0.046		-2.67		1742.63				-0.89	141.12
	242 243		0.00 0.00		-0.01	0.197		-0.047 -0.059	0.000	-3.14		1744.20				-1.31	147.75 153.38
	243		0.00		-0.01 -0.01	0.197 0.186		-0.039 -0.061		-3.52 -3.75		1746.84 1748.13				-1.41 -1.73	160.31
	245		0.00		-0.01	0.175		-0.062		-3.51		1750.16				-1.45	166.52
165	246	-0.13	0.00	0.01	0.00	-0.135	0.000	-0.005	0.001	-3.10	-2.05	1751.40	170.78			-2.06	173.34
166	247	-0.13	0.00	0.01	0.00	-0.135	0.000	-0.005	0.001	-3.46	-2.48	1753.94	176.31			-2.48	179.02
		-0.13		0.01		-0.135		-0.005	0.001	-4.11		1755.17				-3.09	186.03
		-0.13		0.01		-0.135		-0.005	0.001	-4.53		1757.53				-3.50	191.91
169 170		-0.13 -0.13		0.01 0.01		-0.135 -0.135		-0.005 -0.004	0.001 0.011	-5.25 -5.66		1758.69 1760.86				-4.21 -4.58	198.99 205.10
		-0.13				-0.135		-0.004	0.011	-6.37		1761.85				-5.27	212.36
172		-0.13				-0.135		-0.004	0.011	-6.63		1763.72				-5.54	218.74
173		-0.12		0.02		-0.125	0.000	-0.017	0.003	-7.30	-6.27	1764.57	222.18			-6.26	226.15
		-0.12		0.02		-0.125		-0.017	0.003			1766.23					232.76
		-0.10		0.02		-0.105		-0.019	0.002	-8.12		1766.97					240.30
		-0.10		0.03		-0.105		-0.031	0.004			1768.56					247.02
		-0.10 -0.08		0.03 0.03		-0.105 -0.084		-0.031 -0.032	0.004 0.003	-9.23 -9.32		1769.08 1770.34					254.77 261.82
		-0.07		0.03		-0.073		-0.032	-0.007	-9.90		1770.57					269.90
	261		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1771.50					277.19
181	262	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-10.64	-9.67	1771.82	279.50			-9.67	285.17
	263		0.00	0.00	0.00	0.000	0.000	0.000		-10.93		1772.91					292.38
	264		0.00	0.00	0.00	0.000	0.000	0.000		-11.61							300.67
	265 266		0.00	0.00	0.00	0.000 -0.011	0.000	0.000 0.000		-11.58 -10.67		1771.96					308.34 318.27
	267		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1771.74					326.82
	268		0.00	0.00	0.00		-0.040	0.000	0.000			1771.74					337.12
	269		0.00	0.00	0.00	0.000	0.000	0.000		-7.77		1769.21					346.01
7	= 82	(Ph)															
	= 62 (0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.13	-1.38	1334.01	14.32			-1.38	15.39
	176		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.59		1346.42	9.98			-0.87	10.97
	177		0.02	0.00	0.00		-0.027	0.000	0.000	-1.09		1356.47	8.00			-0.34	8.91
	178		0.02	0.00	0.00		-0.027	0.000	0.000	-0.76		1368.62	3.92	3.57	0.024	-0.03	4.75
	179		0.04	0.00	0.00		-0.054	0.001	0.001	-0.58		1378.40	2.22		0.05:	0.34	2.97
	180 181		0.03	0.00	0.00		-0.040 -0.040	0.000	0.001	-0.32 -0.02		1390.33			0.021 0.090	0.44 0.72	-0.96
	181		0.03 0.02	0.00	0.00		-0.040 -0.027	0.001	0.001	-0.02 0.05		1399.78 1411.43				0.72	-2.42 -6.06
	102	0.01	0.02	0.00	0.00	5.011	3.027	3.000	3.000	0.03	0.00	1,11,73	0.00	0.05	0.017	0.00	

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	MFL (MeV)
	= 82	(Ph)															
		` '	0.04	-0.01	0.00	-0.010	-0.054	0.013	0.001	0.01	0.87	1420.58	-7.68	-7.57	0.028	0.87	-7.20
102	184	0.00	0.02	-0.01	0.00	0.000	-0.027	0.012	0.000	0.12	0.73	1431.91	-10.94	-11.05	0.014	0.73	-10.52
	185	-0.01			0.00			0.000	0.000	0.28		1440.83			0.016		-11.44
	186 187	0.00			0.00	0.000 0.011	0.000 0.000	0.000 0.000	0.000 0.000	0.09 -0.00		1451.82 1460.48			0.011 0.008		-14.42 -15.06
	188	0.00			0.00	0.000	0.000	0.000	0.000	-0.30		1471.17			0.003		-17.74
	189	0.00			0.00	0.000	0.000	0.000	0.000	-0.50 -0.53		1471.17			0.011		-17.74 -18.15
108	190	0.00			0.00	0.000	0.000	0.000	0.000	-0.95		1490.01			0.012		-20.54
	191		0.00		0.00	0.000	0.000	0.000	0.000	-1.28		1498.15			0.039		-20.66
	192	0.00			0.00	0.000	0.000	0.000	0.000	-1.87		1508.35			0.013		-22.83
	193 194	0.02	0.00		0.00	0.021	0.000 0.000	0.000 0.000	0.000 0.000	-2.26 -2.99		1516.14 1526.18			0.050 0.017		-22.60 -24.60
	194	0.00			0.00	0.000	0.000	0.000	0.000	-2.99 -3.48		1520.18			0.017		-24.00 -24.07
	196		0.00		0.00	0.000	0.000	0.000	0.000	-4.28		1543.48			0.014		-25.83
115	197	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-4.88	-4.14	1550.84	-24.94	-24.75	0.006	-4.14	-25.15
	198		0.00		0.00	0.000	0.000	0.000	0.000	-5.69		1560.26			0.015		-26.53
	199 200	0.01			0.00	0.011	0.000	0.000	0.000	-6.39		1567.38			0.026		-25.61
	200	0.00	0.00		0.00	0.000	0.000 0.000	0.000 0.000	0.000	-7.22 -8.04		1576.49 1583.45			0.011 0.022		-26.68 -25.58
	202	0.00			0.00	0.000	0.000	0.000	0.000	-8.91		1592.21			0.008		-26.29
121	203	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.82	-8.82	1598.92	-24.59	-24.79	0.007	-8.82	-24.94
	204	0.00			0.00	0.000	0.000	0.000		-10.74		1607.40			0.001	-9.65	-25.37
	205	-0.01			0.00	-0.010	0.000	-0.012				1613.90				-10.57	
	206 207	0.00			0.00	0.000 0.000	0.000 0.000	0.000 0.000				1622.08 1628.30				-11.41 -12.34	
	208	0.00			0.00	0.000	0.000	0.000				1635.60				-12.59	
	209	-0.01			0.00	-0.011	0.000	0.000				1639.62				-11.61	
	210	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-11.85		1645.39	-14.56	-14.73	0.002	-10.60	
	211	0.00			0.00	0.000	0.000	0.000		-10.51		1648.84		-10.49	0.003		-10.32
	212	0.00			0.00	0.000	0.000	0.000	0.000	-9.30		1654.18	-7.21	-7.55	0.002	-8.18	-7.57
	213 214	0.00 0.00			0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-8.10 -6.98		1657.50 1662.65	-2.46 0.46	-3.18 -0.18	0.008 0.002	-7.04 -5.98	-2.81 0.13
	215	0.00			0.00		-0.027	0.000	0.000	-5.98		1665.85	5.33	0.10	0.002	-4.97	5.03
	216		0.04				-0.054	0.001	0.001	-5.22		1670.84	8.41			-4.00	8.14
	217			-0.01		0.023	-0.094	0.014	-0.006	-5.07		1674.03	13.29			-3.21	13.09
	218		0.06		0.00		-0.081	0.002	0.002	-3.91		1678.91	16.49			-2.41	16.30
	219 220			-0.01 -0.01			-0.095 -0.095	0.014 0.014	0.004 0.003	-3.47 -2.73		1681.90 1686.70	21.57 24.84			-1.69 -1.05	21.43 24.74
	221			-0.01			-0.094		-0.006	-2.11		1689.56	30.05			-0.44	30.00
140	222	0.01	0.07	0.00	0.01	0.013	-0.094	0.002	-0.007	-1.44	0.05	1694.20	33.48			0.11	33.48
	223			-0.06		0.162	0.000	0.084	0.013	-2.01		1696.97	38.78			0.65	38.92
	224			-0.06		0.173	0.000	0.085	0.014	-1.82		1701.62	42.20			0.96	42.41
	225 226			-0.05 -0.05		0.172 0.183	0.000 0.000	0.073 0.075	0.012 0.002	-1.51 -1.34		1704.67 1709.33	47.23 50.63			0.86 0.91	47.44 50.91
	227			-0.03 -0.04		0.194	0.000	0.064	0.002	-1.34 -1.30		1712.21	55.83			0.77	56.13
146	228	0.19	0.00	-0.04	0.02	0.204	0.000		-0.009	-1.28		1716.57	59.54			0.93	59.95
	229			-0.03		0.216	0.000		-0.011	-1.47		1719.39	64.79			0.64	65.24
	230			-0.02		0.238	0.000		-0.012	-1.46		1723.58	68.67			0.69	69.18
	231 232			-0.01 -0.01		0.238 0.238	0.000 0.000		-0.015 -0.015	-1.78 -1.73		1726.32 1730.34	74.00 78.06			0.28 0.31	74.58 78.73
	232		0.00		0.02	0.239	0.000		-0.013 -0.018	-1.73 -2.06		1730.34	83.61			-0.08	84.36
	234	0.22			0.02	0.239	0.000		-0.018 -0.021	-2.06 -1.85		1732.80	88.02			0.10	88.88
	235	0.22			0.02	0.240	0.000		-0.021	-1.96		1738.57	94.04			-0.03	94.98
	236	0.22			0.01	0.240		-0.002		-1.56		1741.90	98.78			0.23	99.79
	237	0.22			0.01	0.240		-0.002		-1.64		1743.68	105.07			0.17	106.17
	238	0.19			0.01	0.206		-0.008		-1.11		1746.90	109.92				111.15
157	239	0.19	0.00	0.03	0.00	0.207	0.000	-0.021	-0.006	-1.42	0.09	1748.70	116.19			0.10	117.52

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E_{s+p}	E _{mic}	E _{bind}	M _{th}	M _{exp}	σ _{exp}	E _{mic} (May)	M _{th} FL
		(DL)								(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
	= 82 (0.00	0.02	0.00	0.106	0.000	0.022	0.005	1 22	0.10	1551 00	101.00			0.16	100.54
	240	0.18		0.03	0.00	0.196		-0.023		-1.33		1751.88	121.09			0.16	122.54
159	241	0.19		0.04	0.00	0.207		-0.033	-0.008	-1.96		1753.69	127.35			-0.28	128.94
160		0.18		0.04	0.00	0.196		-0.034	-0.007	-1.96		1756.81	132.29			-0.37	134.02
161		0.18		0.05	-0.01	0.197	0.000	-0.047	0.000	-2.63		1758.46	138.72			-0.82	140.61
162		0.18		0.06	-0.01	0.197		-0.059	-0.002	-2.97		1761.44	143.81			-0.90	145.90
163		0.17		0.06	-0.01	0.186	0.000	-0.061	-0.001	-3.19		1762.74	150.58			-1.22	152.81
164			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-1.66		1765.39	156.00			-1.36	158.22
	247	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-2.23		1766.76	162.70			-1.93	165.07
166			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.58		1769.51	168.02			-2.21	170.54
167			0.00	-0.01	0.00	0.021	0.000	0.012	0.000	-3.18		1770.60	175.01			-2.65	177.69
		-0.02		0.00		-0.021	0.000	0.000	0.000	-3.53		1773.22	180.46			-2.98	183.30
		-0.13		0.01		-0.135	0.000	-0.005	0.001	-4.80		1774.48	187.27			-3.79	190.26
170		-0.13		0.01		-0.135	0.000	-0.004	0.011	-5.18		1776.98	192.84			-4.13	196.04
171		-0.13		0.01		-0.135	0.000	-0.004	0.011	-5.90		1777.98	199.91			-4.83	203.28
		-0.13		0.01		-0.135	0.000	-0.004	0.011	-6.14		1780.18	205.78			-5.09	209.33
		-0.12		0.02		-0.125		-0.017	0.003	-6.73		1780.95	213.08			-5.72	216.80
		-0.01		0.00		-0.011	0.000	0.000	0.000	-6.45		1782.91	219.19			-5.91	223.09
		-0.12		0.02	0.00	-0.125	0.000	-0.017	0.003	-7.64		1783.68	226.50			-6.68	230.60
176		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-7.47		1785.54	232.71			-6.93	237.00
177		0.02	0.00	0.00	0.00	0.021	0.000	0.000	0.000	-8.20		1786.02	240.30			-7.58	244.79
178			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.55		1787.61	246.78			-7.71	251.47
179		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-9.35		1788.04	254.42			-8.45	259.33
180			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.69		1789.65	260.88			-8.76	266.00
181		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-10.50		1789.95	268.65			-9.52	273.99
182	264	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-10.76	-9.76	1791.34	275.33			-9.76	280.90
183	265	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-11.41	-10.37	1791.35	283.40			-10.37	289.20
184		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000		-10.30		290.53			-10.31	296.57
	267	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-10.42		1790.65	300.24			-9.42	306.51
186		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.66		1790.77	308.19			-8.67	314.71
187	269	0.01	0.04	0.00	0.00	0.011	-0.054	0.001	0.001	-8.83	-7.64	1788.85	318.18			-7.61	324.98
188			0.05	0.00	0.00		-0.067	0.001	0.002	-7.98		1788.63	326.47			-6.65	333.55
189			0.08	-0.01	0.00		-0.109	0.015	0.005	-8.15		1787.18	335.99			-6.14	343.41
190				-0.01	0.00		-0.123	0.016	0.006	-7.70		1787.10	344.15			-5.44	351.87
191	273	0.03	0.09	-0.01	0.00	0.035	-0.123	0.016	0.006	-7.42	-5.36	1785.69	353.63			-5.19	361.61
\boldsymbol{z}	= 83 ((Bi)															
	178	` '	0.07	-0.01	0.00	0.077	-0.096	0.016	0.004	-1.23	0.28	1353.29	18.48			0.26	19.55
	179			-0.01	0.00		-0.096	0.016	0.004	-0.73		1365.37	14.46			0.71	15.46
97	180			-0.01	0.00		-0.095	0.015	0.004	-0.30		1375.62	12.28			1.08	13.19
	181	0.05	0.07	-0.01	0.00		-0.095	0.015	0.004	0.03		1387.43	8.55			1.38	9.39
99	182	0.27	0.00	-0.01	0.01	0.294	0.000	0.045	-0.003	-0.77	1.35	1397.67	6.38			1.27	7.07
100	183	0.28	0.00	0.00	0.01	0.306	0.000	0.036	-0.006	-0.79	1.40	1409.28	2.84			1.33	3.46
101		0.28		0.01	0.01	0.307	0.000		-0.009	-0.92		1419.19	1.00			1.21	1.54
	185	0.28		0.01	0.01	0.307	0.000		-0.009	-0.81		1430.29	-2.04			1.37	-1.54
	186	0.27		0.02	0.01	0.296	0.000		-0.013	-0.85		1439.86	-3.53	-3.17	0.077	1.20	-3.11
104	187	0.27		0.03	0.00	0.297	0.000	-0.005	-0.007	-0.68	1.45	1450.53	-6.13	-6.37	0.015	1.39	-5.76
105	188	-0.19	0.00	0.00	0.00	-0.196	0.000	0.014	-0.001	-0.27	1.19	1459.82	-7.35	-7.20	0.050	1.15	-7.02
		-0.19		0.00		-0.196	0.000		-0.001	-0.58		1470.54		-10.06	0.054	0.90	-9.71
		-0.19		0.00		-0.196	0.000		-0.001	-0.88			-10.84		0.185		-10.62
		-0.19		0.00		-0.196	0.000		-0.001	-1.13			-13.11		0.007		-12.94
	192			-0.01	0.00	0.085	0.000	0.015	0.001	-0.66			-13.66		0.033		-13.52
	193			-0.01	0.00	0.075	0.000	0.014	0.001	-1.14			-15.76		0.010		-15.67
	194			-0.01	0.00	0.073	0.000	0.014	0.001	-1.14 -1.56			-15.70 -16.02		0.010		-15.07 -15.98
	195	-0.05			0.00		0.000	0.014		-2.17			-18.26		0.006		-18.26
	196			-0.01	0.00	0.053	0.000	0.013	0.001	-2.68			-17.88		0.024		-17.93
		-0.05				-0.052	0.000		-0.001	-3.45			-19.87		0.008		-19.95
		-0.05				-0.052	0.000		-0.001	-4.08			-19.65		0.028		-19.76
		-0.05				-0.052 -0.052	0.000		-0.001	-4.08 -4.88			-19.03 -20.96		0.028		-19.76 -21.11
	.,,	0.03	0.00	0.01	0.00	0.052	3.000	0.013	5.001	1.00	1.20	1552.21	20.70	20.00	0.012	1.20	21.11

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 83 ((Bi)															
		-0.04	0.00	-0.01	0.00	-0.042	0.000	0.012	-0.001	-5.56	-4.92	1569.79	-20.47	-20.37	0.024	-4.92	-20.65
118		-0.05				-0.052	0.000	0.013	-0.001	-6.41		1578.91			0.015		-21.72
		-0.05 -0.04		0.00		-0.052	0.000	0.001	0.000	-7.21		1586.35			0.020		-21.12
120		-0.04 -0.05		0.00		-0.042 -0.052	0.000 0.000	0.001	0.000 0.000	-7.98 -9.00		1595.07 1602.30			0.022 0.026		-21.79 -20.97
		-0.04		0.00		-0.042	0.000	0.001	0.000	-9.77		1610.67			0.007		-21.28
123		-0.03		0.00		-0.032	0.000	0.001		-10.69		1617.46			0.007		-20.02
124		-0.02		0.00	0.00	-0.021	0.000	0.000				1625.63			0.002	-10.43	-20.13
125		-0.01		0.00		-0.011	0.000	0.000				1632.23				-11.33	
		-0.01		0.00		-0.011	0.000	0.000				1639.56				-11.56	
		-0.02 -0.01				-0.021 -0.010	0.000 0.000	0.012	-0.000 -0.000	-11.92 -10.82		1644.11 1649.84			0.001	-10.69	-14.41 -12.08
		-0.01		0.00		-0.011	0.000	0.000	0.000	-9.50		1653.82	-7.64	-8.12	0.002	-8.46	-7.98
130	213	-0.01	0.00	-0.01	0.00	-0.010	0.000	0.012	-0.000	-8.31		1659.14	-4.88	-5.23	0.005	-7.24	-5.22
		-0.01			0.00	-0.010	0.000	0.012	-0.000	-7.12		1662.88	-0.56	-1.20	0.011	-6.12	-0.88
		-0.02			0.00		0.000		-0.000	-6.05		1668.16	2.24	1.65	0.015	-5.14	1.93
	216 217			-0.02 -0.02	0.00		-0.123 -0.109	0.028 0.027	0.007 0.006	-6.91 -5.65		1671.86 1676.99	6.61 9.55	5.87	0.011	-4.17 -3.33	6.39 9.34
	218			-0.02	0.00		-0.109 -0.110	0.027	0.006	-3.03 -4.95		1680.65	13.96			-3.53 -2.64	13.77
	219			-0.02	0.00		-0.110	0.027	0.006	-4.11		1685.60	17.08			-1.86	16.92
137	220	0.07	0.08	-0.03	0.00	0.077	-0.111	0.041	0.008	-3.82	-1.47	1689.24	21.52			-1.39	21.40
	221			-0.03	0.00		-0.111	0.041	0.008	-3.13		1694.04	24.79			-0.71	24.72
	222			-0.03	0.00	0.098		0.041	0.007	-2.33		1697.40	29.50			-0.24	29.45
	223 224			-0.06 -0.06	-0.01 0.00	0.141 0.151	0.000 0.000	0.081 0.083	0.022 0.012	-2.13 -2.11		1702.06 1705.61	32.91 37.43			0.41 0.44	32.98 37.51
	225			-0.06	0.00	0.162	0.000	0.084	0.013	-1.89		1710.27	40.85			0.78	40.99
	226			-0.06	0.01	0.172	0.000	0.086	0.004	-1.96		1713.64	45.54			0.77	45.73
	227			-0.05	0.01	0.183	0.000	0.075	0.002	-1.44		1718.37	48.88			0.76	49.10
	228			-0.05	0.02	0.193	0.000		-0.007	-1.74		1721.66	53.66			0.64	53.96
	229			-0.04	0.02	0.204	0.000		-0.009	-1.36		1725.99	57.40			0.80	57.74
	230 231			-0.03 -0.02	0.02	0.216 0.238	-0.013 0.000		-0.011 -0.012	-1.53 -1.50		1729.13 1733.38	62.34 66.16			0.57 0.59	62.71 66.59
	232			-0.02	0.02	0.238	0.000		-0.012 -0.012	-1.90		1735.38	71.13			0.39	71.63
	233			-0.01	0.02	0.238	0.000		-0.015			1740.46	75.23			0.29	75.80
151	234	0.22	0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-2.01	-0.11	1743.31	80.44			-0.06	81.09
	235		0.00	0.00	0.02	0.239	0.000		-0.018	-1.79		1747.00	84.83			0.11	85.57
	236 237		0.00 0.00	0.01 0.01	0.02	0.240 0.240	0.000 0.000		-0.021 -0.021	-1.88 -1.52		1749.39 1752.74	90.51 95.22			0.02 0.31	91.35 96.16
	238		0.00	0.01	0.02	0.240	0.000		-0.021 -0.013	-1.52 -1.50		1754.87	101.17			0.31	102.16
	239		0.00	0.01	0.01	0.195	0.000		-0.011	-0.91		1758.05	106.06			0.50	107.15
157	240	0.18	0.00	0.02	0.00	0.195	0.000	-0.010	-0.003	-1.20	0.21	1760.22	111.96			0.21	113.14
	241		0.00	0.03	0.00	0.196		-0.023		-1.28		1763.47	116.79			0.23	118.10
	242		0.00	0.03	0.00	0.185		-0.024		-1.54		1765.51	122.81				124.24
	243 244		0.00 0.00	0.04	0.00 -0.01	0.185 0.197		-0.036 -0.047	-0.007 0.000	-1.75 -2.46		1768.72 1770.70	127.68 133.77				129.26 135.50
	245		0.00		-0.01	0.185		-0.049	0.001	-2.45		1773.63	138.91			-0.73	140.78
	246		0.00		-0.01	0.185		-0.049	0.001	-2.76		1775.30	145.31			-1.07	147.31
164	247	0.16	0.00	0.05	-0.01	0.174	0.000	-0.050	0.001	-2.54	-0.99	1777.80	150.88			-0.89	153.03
					0.00		0.000		-0.000	-1.99		1779.42	157.33			-1.45	159.52
		-0.03				-0.032	0.000		-0.000	-2.28		1782.33	162.49			-1.88	164.83
		-0.03				-0.032	0.000		-0.000	-2.89		1783.80	169.10			-2.35	171.59
		-0.10 -0.10				-0.104 -0.104	0.000 0.000		-0.001 -0.001	-3.62 -4.37		1786.53 1788.06	174.44 180.97			-2.78 -3.51	177.07 183.77
		-0.10				-0.104	0.000		-0.001	-4.72		1790.54	186.57			-3.85	189.52
171	254	-0.12	0.00	-0.01	-0.01	-0.125	0.000	0.018	0.008	-5.56	-4.57	1791.90	193.28			-4.55	196.42
						-0.125	0.000	0.018	0.008	-5.84		1794.15	199.10				202.41
173	256	-0.10	0.00	0.00	-0.01	-0.104	0.000	0.004	0.009	-6.34	-5.55	1795.33	205.99			-5.54	209.48

	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	$E_{ m mic}$	$E_{ m bind}$	$M_{ m th}$	$M_{\rm exp}$	$\sigma_{ m exp}$	$E_{ m mic}^{ m FL}$	$M_{ m th}^{ m FL}$
1 V	11	c 2	<i>C</i> 3	C 4	C 6	P2	Ρ3	μ 4	Po	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
\overline{z}	= 83 ((Bi)															
174	257	-0.05	0.00	-0.01	0.00	-0.052	0.000	0.013	-0.001	-6.34	-5.76	1797.33	212.07			-5.75	215.72
175		-0.10		0.01		-0.105	0.000	-0.008	0.001	-7.25		1798.35	219.11			-6.47	222.94
		-0.08		0.01		-0.084	0.000	-0.009	0.010	-7.45		1800.24	225.29			-6.69	229.35
		-0.05 -0.03		0.00 0.00		-0.052 -0.032	0.000 0.000	0.001	0.000	-7.97 -8.13		1801.01 1802.65	232.60 239.03			-7.32 -7.49	236.82 243.44
		-0.03							0.000			1803.20					
179 180			0.00	0.00 0.00		-0.032 -0.021	0.000 0.000	0.000 0.000	0.000 0.000	-8.87 -9.11	-8.03 -8.23	1803.20	246.55 253.11			-8.03 -8.23	251.17 257.94
		-0.01		0.00		-0.011	0.000	0.000	0.000	-9.88		1805.28	260.61			-8.94	265.65
		-0.01	0.00	0.00		-0.011	0.000	0.000	0.000	-10.10		1806.64	267.33			-9.13	272.59
183	266	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-10.74	-9.74	1806.97	275.07			-9.74	280.55
	267	0.00		0.01	0.00	0.000	0.000	-0.012		-10.65		1807.85	282.26			-9.61	287.97
	268 269	-0.01 -0.01	0.00	-0.01 0.00	0.00 0.00	-0.010 -0.011	0.000 0.000	0.012 0.000	-0.000 0.000	-9.80 -8.95	-8.81 -8.01	1806.61 1806.69	291.57 299.57			$-8.80 \\ -8.01$	297.51 305.74
	270		0.03		-0.00	0.011	-0.041	0.000	0.000	-8.93 -8.08		1805.11	309.21			-6.95	315.68
188					0.00		-0.068	0.013	0.002	-7.32		1804.88	317.51			-6.00	324.23
189	272	0.03	0.08	-0.01	0.00	0.035	-0.109	0.015	0.005	-7.52	-5.66	1803.78	326.68			-5.54	333.72
190	273	0.04	0.09	-0.02	0.00	0.046	-0.123	0.028	0.007	-7.24	-5.08	1803.78	334.75			-4.90	342.10
	274			-0.02	0.00		-0.137	0.028	0.008	-7.40		1802.82	343.79			-4.75	351.43
	275276			-0.01 -0.01	0.01		-0.149 -0.149	0.017	-0.001 -0.001	-6.97 -6.70		1802.68 1801.47	352.00 361.28			-4.15 -3.91	359.92 369.47
			0.11	-0.01	0.01	0.040	-0.149	0.017	-0.001	-0.70	-4.14	1001.47	301.20			-3.91	309.47
	= 84 (181		0.00	-0.03	0.01	0.294	0.000	0.070	0.005	-1.05	1 51	1374.52	20.67			1.43	21.70
	182			-0.03 -0.02	0.01	0.294	0.000	0.070	0.003	-0.84		1374.32	16.09			1.45	17.06
	183		0.00		0.02	0.306	0.000	0.049		-1.07		1397.65	13.69			1.13	14.55
	184	0.29		0.00	0.02	0.318	0.000		-0.015	-1.09		1409.74	9.66			1.19	10.46
	185	0.29	0.00	0.01	0.02	0.318	0.000	0.027	-0.019	-1.24		1419.69	7.79			1.09	8.50
	186	0.30		0.02	0.01	0.330	0.000		-0.012	-1.14		1431.27	4.28			1.23	4.93
103	187	0.29 0.28	0.00	0.02 0.03	0.01	0.319 0.308	0.000 0.000		-0.013 -0.006	-1.08 -0.72		1440.76 1451.91	2.86 -0.22	-0.54	0.019	1.20 1.38	3.43 0.30
	189	0.27	0.00	0.03	0.00	0.297	0.000	-0.002		-0.75		1461.14	-1.37	-1.41	0.022	1.22	-0.93
106	190	-0.21	0.00	0.00	0.00	-0.217	0.000	0.017	-0.001	-0.34		1472.01	-4.17	-4.56	0.013	1.30	-3.76
107	191	-0.21	0.00	0.00	0.00	-0.217	0.000		-0.001	-0.66	1.08	1480.96	-5.06	-5.05	0.011	1.04	-4.70
		-0.21		0.00		-0.217	0.000		-0.001	-0.89		1491.73	-7.75	-8.07	0.012	0.81	-7.45
		-0.21 -0.20		0.00		-0.217 -0.207	0.000 0.000		-0.001 -0.001	-1.17 -1.29		1500.35 1510.77			0.035 0.013	0.52	-8.06 -10.45
		-0.20		0.00		-0.207	0.000		-0.001	-1.60		1510.77			0.013		-10.43 -10.74
	196	0.08		0.00	0.00	0.085	0.000	0.003	0.000	-1.21		1529.25			0.013		-12.88
	197	0.08		0.00	0.00	0.085	0.000	0.003	0.000	-1.77		1537.39			0.050		-12.99
	198	0.07		0.00	0.00	0.075	0.000	0.002	0.000	-2.37		1547.43			0.017		-15.00
	199 200	0.07		0.00	0.00 0.00	0.075 -0.063	0.000 0.000	0.002 0.013	0.000	-3.01 -3.75		1555.33			0.023 0.014		-14.87
		-0.06							-0.001			1565.52					-17.02
117 118		0.05 -0.06		0.00 0.00	0.00	0.053 -0.063	0.000 0.000	0.001 0.001	0.000 0.000	-4.40 -5.25		1572.80 1582.71			0.006 0.015		-16.27 -18.15
		-0.06		0.00		-0.063	0.000	0.001	0.000	-6.08		1590.16			0.026		-17.55
		-0.04		0.00	0.00	-0.042	0.000	0.001	0.000	-6.82	-6.15	1599.29	-18.46	-18.33	0.011	-6.15	-18.64
121	205	-0.05	0.00	0.00	0.00	-0.052	0.000	0.001	0.000	-7.81	-7.05	1606.53	-17.63	-17.51	0.020	-7.06	-17.84
	206	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.57		1615.19			0.008		-18.45
	207	0.02		0.00	0.00	0.021	0.000	0.000	0.000	-9.54		1622.08			0.007		-17.28
	208 209	0.00 0.00		0.00 0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000 0.000		-10.51 -11.53		1630.81 1637.50			0.002	-9.33 -10.30	-17.95 -16.59
	210	0.00		0.00	0.00	0.000	0.000	0.000				1645.24				-10.53	
127	211	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000		-10.74		1649.74			0.001		-12.70
128	212	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-9.74		1655.98	-10.58	-10.37	0.001	-8.59	-10.88
	213	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.40		1659.89	-6.41	-6.65	0.003	-7.32	-6.72
130 131	214	0.00		0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000	0.000 0.000	-7.22 -6.03		1665.71 1669.49	-4.16 0.12	-4.47 -0.54	0.002	-6.20 -5.08	-4.46 -0.17
	216		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-0.03 -4.94		1675.12	2.57	1.78	0.003	-3.08 -4.05	2.28
132	210	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.94	-4.03	10/3.12	2.31	1./0	0.002	-4.03	2.20

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 84 (Po)															
133	217	0.04	0.09	-0.02	0.00	0.046	-0.123	0.028	0.007	-6.05	-3.44	1679.15	6.61	5.90	0.007	-3.37	6.41
134	218	0.05	0.09	-0.02	0.00	0.056	-0.123	0.028	0.007	-5.19	-2.61	1684.71	9.12	8.36	0.002	-2.53	8.94
135				-0.04	0.00		-0.111	0.054	0.009	-4.78		1688.57	13.33			-1.99	13.19
	220			-0.04	0.00		-0.125	0.055	0.011	-4.45		1694.00	15.97			-1.27	15.88
137				-0.04	0.00		-0.125	0.055	0.011	-4.03		1697.74	20.30			-0.89	20.23
138				-0.04	0.00		-0.111	0.055	0.011	-3.02		1702.93	23.18			-0.21	23.14
	223 224			-0.07 -0.07	-0.01 -0.01	0.141 0.141	0.000 0.000	0.094 0.094	0.024 0.024	-2.87 -2.46		1706.46 1711.69	27.73 30.56			0.21 0.61	27.78 30.67
141				-0.07	0.00	0.151	0.000	0.095		-2.44		1715.31	35.02			0.61	35.14
142	226			-0.06	0.00	0.162	0.000	0.084	0.013	-1.76		1720.33	38.07			0.93	38.20
143	227	0.17	0.00	-0.06	0.01	0.183	0.000	0.087	0.005	-1.98	0.77	1723.74	42.73			0.91	42.89
	228	0.18	0.00	-0.05	0.01	0.194	0.000	0.076	0.003	-1.48		1728.88	45.66			0.87	45.85
	229			-0.05	0.02	0.204	0.000	0.079	-0.006	-1.82		1732.24	50.37			0.71	50.63
	230			-0.04	0.02	0.204	0.000			-1.30		1736.93	53.76			0.90	54.05
147				-0.03	0.03	0.237	0.000		-0.020	-1.87		1740.29	58.46			0.52	58.84
	232 233			-0.03 -0.02	0.03	0.237 0.238	0.000 0.000		-0.020 -0.022	-1.79 -2.03		1744.87 1747.97	61.96 66.93			0.62 0.24	62.42 67.44
150				-0.02 -0.01	0.03	0.238	0.000			-2.03 -1.65		1747.97	70.72			0.24	71.24
151				-0.01	0.03	0.238	0.000		-0.025			1755.17	75.87			0.01	76.52
152	236	0.22		0.00	0.02	0.239	0.000		-0.018			1759.16	79.96			0.19	80.63
153	237	0.22	0.00	0.01	0.02	0.240	0.000	0.011	-0.021	-1.75	0.06	1761.55	85.64			0.12	86.39
154	238	0.22	0.00	0.01	0.02	0.240	0.000	0.011	-0.021	-1.40	0.34	1765.28	89.97			0.40	90.83
	239	0.22		0.02	0.01	0.240	0.000		-0.013			1767.32	96.00			0.43	96.90
	240	0.19		0.01	0.01	0.206	0.000		-0.011	-0.73		1770.88	100.52			0.68	101.51
157		0.19		0.02	0.01	0.206			-0.013			1773.00				0.48	107.56
158		0.18		0.02	0.00	0.195			-0.003	-0.83		1776.48				0.59	112.24
159 160	243	0.18 0.18		0.03 0.04	0.00 0.00	0.196 0.196			-0.005 -0.007	-1.27 -1.46		1778.62 1782.18				0.19 0.07	118.30 122.95
	245		0.00	0.04	-0.00	0.190		-0.034	0.000	-2.09		1784.11				-0.29	129.24
162	246	0.18			-0.01	0.197		-0.047	0.000	-2.13		1787.42				-0.39	134.13
163	247	0.17	0.00	0.05	-0.01	0.185	0.000	-0.049	0.001	-2.33	-0.75	1789.04	138.85			-0.65	140.71
164	248	0.16	0.00	0.05	-0.01	0.174	0.000	-0.050	0.001	-2.10	-0.55	1791.86	144.11			-0.44	146.10
165			0.00	0.00	0.00	0.085	0.000	0.003	0.000			1793.50					152.56
	250			-0.01	0.00	0.075	0.000	0.014				1796.61					157.67
		-0.10				-0.104	0.000		-0.001								164.24
		-0.10				-0.104	0.000		-0.001								169.54
		-0.10				-0.104 -0.104	0.000 0.000	0.015	-0.001			1802.72					176.21 181.62
						-0.104 -0.104	0.000	0.016				1806.89					188.51
						-0.104	0.000	0.016				1809.42					194.23
173	257	-0.10	0.00	-0.01	-0.01	-0.104	0.000	0.016	0.008	-5.67	-4.87	1810.60	198.01			-4.85	201.28
174	258	-0.10	0.00	0.00	-0.01	-0.104	0.000	0.004				1812.94					207.18
		-0.10		0.01		-0.105	0.000	-0.008				1813.92					214.43
		-0.05		0.00		-0.052	0.000	0.001				1816.12					220.49
		-0.08		0.01		-0.084	0.000	-0.009				1816.92					227.95
		-0.03		0.00		-0.032	0.000	0.000				1818.86					234.26
	263264	0.01		0.00	0.00	0.011	0.000 0.000	0.000	0.000			1819.30 1821.19					242.09 248.47
	265	0.00		0.00	0.00	0.000	0.000	0.000	0.000			1821.19					256.10
	266	0.00		0.00	0.00	0.000	0.000	0.000				1823.50					262.72
	267		0.00	0.00	0.00	0.000	0.000	0.000				1823.82					270.68
184		0.00		0.00	0.00	0.000	0.000	0.000				1825.06					277.73
	269	-0.01		0.00	0.00	-0.011	0.000	0.000				1823.75					287.34
	270	0.00		0.00	0.00	0.000	0.000	0.000				1824.20					295.18
187		0.01	0.04	0.00	0.00	0.011	-0.054	0.001	0.001	-7.37	-6.23	1822.64	298.97			-6.20	305.08
	272	0.01		0.00	0.00		-0.081	0.002				1822.80					313.27
189	273	0.03	0.08	-0.01	0.00	0.035	-0.109	0.015	0.005	-6.89	-5.05	1821.80	315.96			-4.93	322.64

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 84 ((Po)															
	274	` ′	0.09	-0.01	0.00	0.035	-0.123	0.016	0.006	-6.53	-4.46	1822.11	323.72			-4.30	330.69
191	275	0.04	0.10	-0.01	0.01		-0.135	0.016	-0.003	-6.66	-4.35	1821.15	332.74			-4.16	340.00
192	276	0.04	0.11	-0.01	0.01	0.048	-0.149	0.017	-0.001	-6.42	-3.84	1821.40	340.57			-3.60	348.12
193				-0.01	0.01		-0.163	0.018	0.000			1820.23	349.80			-3.38	357.65
194	278	0.04	0.12	-0.01	0.02	0.048	-0.162	0.018	-0.010	-5.86	-3.07	1820.27	357.84			-2.73	366.01
195	279	0.03	0.12	-0.01	0.02	0.038	-0.162	0.018	-0.010	-5.45	-2.72	1818.82	367.36			-2.39	375.80
	= 85 (
	184		0.00		0.01	0.317	0.000		-0.001	-1.38		1395.58	23.04			0.77	24.05
100	185	0.29 0.30		0.00	0.01	0.318 0.330	0.000 0.000		-0.005 -0.018	-1.27 -1.56		1407.72 1418.10	18.97			$0.84 \\ 0.77$	19.92 17.51
101		0.30		0.01	0.02	0.330	0.000		-0.018	-1.36 -1.45		1416.10	16.66 13.10			0.77	17.51
102		0.30		0.01	0.02	0.353	0.000		-0.018	-1.43		1439.64	11.27			0.93	11.96
104		0.33		0.01	0.01	0.364	0.000		-0.007	-1.55		1450.81	8.17			1.14	8.80
105		0.33		0.01	0.00	0.364	0.000	0.036	0.003	-1.50		1460.28	6.77			1.19	7.32
106	191	-0.22	0.00	0.00	0.00	-0.227	0.000	0.019	-0.002	-0.49	1.32	1471.24	3.88			1.27	4.43
107	192	-0.22	0.00	0.00	0.00	-0.227	0.000	0.019	-0.002	-0.82	1.03	1480.68	2.52			0.98	3.00
108	193	-0.22	0.00	0.00	0.00	-0.227	0.000	0.019	-0.002	-1.02	0.83	1491.47	-0.20	-0.15	0.054	0.79	0.22
109	194	-0.22	0.00	0.00	0.00	-0.227	0.000	0.019	-0.002	-1.31	0.56	1500.52	-1.19	-1.19	0.186	0.51	-0.83
		-0.21		0.00		-0.217	0.000		-0.001	-1.38		1510.95	-3.54	-3.48	0.009	0.31	-3.22
		-0.21		0.00		-0.217	0.000		-0.001	-1.68		1519.68	-4.20	-3.92	0.060	-0.01	-3.95
		-0.20		0.00		-0.207	0.000		-0.001	-1.80		1529.78	-6.23	-6.34	0.051	-0.25	-6.02
		-0.20		0.00		-0.207	0.000		-0.001	-2.19		1538.26	-6.64	-6.67	0.049	-0.65	-6.48
114		0.09		0.00	0.00	0.096	0.000	0.003	0.000	-1.72		1548.02	-8.33	-8.82	0.050	-0.89	-8.19
115		0.09		0.00	0.00	0.096	0.000	0.003	0.000	-2.33		1556.23	-8.47	-8.99	0.024	-1.37	-8.37
116 117		$0.08 \\ 0.08$		0.01 0.01	0.00	0.086	0.000 0.000	-0.009 -0.009	-0.001 -0.001	-2.98 -3.64		1566.28 1574.05		-10.79	0.008 0.028	-2.27 -2.64	
118		-0.08		-0.01	-0.00	-0.083	0.000	0.014	0.009	-3.64 -4.52		1584.13			0.028	-3.89	
	204	-0.08		0.00		-0.084	0.000		-0.000	-5.29		1591.98			0.024	-4.67	
		-0.03 -0.07		0.00		-0.034 -0.073	0.000	0.002	-0.000	-5.29 -5.99		1601.14			0.024	-5.34	
121		-0.07		0.00		-0.073	0.000	0.002	-0.000	-6.93		1608.79			0.020	-6.23	
122	207	-0.05		0.01		-0.053	0.000	-0.011	0.001	-7.63		1617.57			0.021	-6.84	
123	208	-0.04	0.00	0.02	0.00	-0.042	0.000	-0.023	0.001	-8.59	-7.67	1624.86	-12.52	-12.49	0.026	-7.67	-12.69
124		0.01		0.00	0.00	0.011	0.000	0.000	0.000	-9.26		1633.29			0.007	-8.25	
125		0.01		0.00	0.00	0.011	0.000	0.000						-11.97		-9.03	
126		0.00		0.00	0.00	0.000	0.000	0.000				1648.03			0.003		-11.70
127		-0.01	0.00		0.00	0.011	0.000	0.012	0.000			1653.06	-8.44 -6.59	-8.62	0.007	-8.42	-8.67
				0.00		-0.011	0.000	0.000	0.000			1659.28		-6.58		-7.38	-6.83
130		-0.01 0.01		0.00	-0.01 0.00	-0.010 0.011	0.000 0.000	0.000	0.010			1663.79 1669.57	-3.03 -0.74	-3.38 -1.25	0.004	-6.30 -5.11	-3.27 -0.99
131				-0.03	0.00		-0.124	0.040	0.008			1674.04	2.87	$\frac{-1.23}{2.26}$	0.007	-3.11 -4.20	2.68
132				-0.03	0.00		-0.138	0.041	0.010			1679.95	5.03	4.40		-3.39	4.87
133				-0.04	0.00		-0.139	0.055	0.012			1684.52	8.53	8.10		-2.91	8.39
134	219	0.09	0.09	-0.05	-0.01	0.100	-0.127	0.067	0.023	-5.95	-2.33	1690.26	10.86	10.40	0.004	-2.18	10.77
135		0.10	0.09	-0.05	0.00		-0.125	0.068	0.014			1694.70	14.49	14.35	0.051	-1.87	14.39
136	221	0.10	0.09	-0.05	0.00	0.110	-0.125	0.068	0.014	-4.81	-1.34	1700.21	17.05			-1.21	16.98
137				-0.05	0.00		-0.125	0.068	0.014			1704.34	20.99			-0.82	20.93
138	223	0.11	0.08	-0.05	0.01	0.120	-0.111	0.068	0.003	-3.33	-0.29	1709.58	23.82			-0.17	23.79
139	224	0.13	0.04	-0.07	-0.01	0.142	-0.056	0.094	0.025	-3.35	-0.06	1713.63	27.85			0.12	27.90
140				-0.07			-0.028	0.095	0.026	-2.78		1718.86	30.68			0.54	30.77
141				-0.07	0.00		-0.028	0.097	0.016	-2.81		1722.91	34.71			0.49	34.80
142				-0.07	0.01	0.172	0.000	0.098	0.006	-2.40		1727.96	37.72			0.84	37.86
143				-0.06	0.01	0.183	0.000	0.087	0.005	-2.15		1732.00	41.76			0.56	41.89
144				-0.06	0.02	0.193	0.000		-0.004	-2.03		1737.02	44.81			0.72	45.01
145				-0.05	0.02	0.204	0.000		-0.006	-1.99		1740.75	49.15			0.51	49.36
146 147				-0.05 -0.04	0.03	0.215 0.237	0.000 0.000		-0.016 -0.017	-1.99 -2.30		1745.56 1749.22	52.41 56.83			0.68 0.33	52.73 57.17
147				-0.04 -0.03	0.03	0.237	0.000		-0.017 -0.020	-2.30 -1.95		1749.22	60.33			0.33	60.72
		0.22	0.00	0.03	0.03	0.231	3.000	3.000	5.020	1.73	0.52	1,55.17	50.55			J. TJ	

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{\rm th}^{\rm FL}$ (MeV)
Z =	= 85 ((At)															
149	234	0.22	0.00	-0.02	0.03	0.238	0.000	0.048	-0.022	-2.15	0.00	1757.22	64.96			0.11	65.40
	235			-0.02	0.03	0.238	0.000		-0.022			1761.60	68.66			0.22	69.18
151 152	236	0.22		-0.01 0.00	0.03	0.238 0.239	0.000 0.000		-0.025 -0.018			1764.81 1768.78	73.52 77.62			-0.11 0.11	74.10 78.22
152		0.22		0.00	0.02	0.239	0.000		-0.018 -0.018			1771.56	82.91			0.11	83.57
	239	0.22		0.01	0.02	0.240	0.000		-0.021			1775.22	87.32			0.40	88.08
	240	0.22		0.01	0.02	0.240	0.000		-0.021	-1.39 -1.37		1777.63	92.99			0.40	93.83
156		0.18		0.01	0.01	0.195	0.000		-0.011	-0.59		1781.09	97.60			0.80	98.49
	242	0.18		0.01	0.01	0.195	0.000		-0.011	-0.90		1783.64				0.52	104.09
158	243	0.17	0.00	0.02	0.00	0.184	0.000	-0.012	-0.003	-0.73	0.61	1787.18	107.66			0.61	108.73
159	244	0.17	0.00	0.03	0.00	0.185	0.000	-0.024	-0.005	-1.11	0.33	1789.54	113.36			0.34	114.55
	245	0.17		0.03	0.00	0.185			-0.005			1793.17					119.10
	246	0.17		0.04	0.00	0.185			-0.007			1795.46				-0.24	125.01
	247	0.18			-0.01	0.197		-0.047	0.000	-1.97		1798.70				-0.21	130.00
	248	0.17			-0.01	0.185		-0.049		-2.21		1800.74					136.15
	249 250	0.16			-0.01	0.174 0.129		-0.050 -0.006	0.001	-1.98 -1.70		1803.57 1805.47					141.52 147.72
165 166		0.12 0.08		0.01	0.00	0.129	0.000 0.000	-0.006	-0.001 0.000	-1.70 -1.74		1805.47					147.72
		-0.13		-0.01	0.00		0.000	0.018	-0.002			1810.57					159.04
		-0.13		0.00		-0.135	0.000	0.007	-0.000	-2.94		1813.58					164.23
169	254	-0.13	0.00	0.00	-0.01	-0.135	0.000	0.007	0.009	-3.71	-2.75	1815.46	168.15			-2.74	170.58
		-0.10				-0.104	0.000	0.016	0.008	-3.88		1818.18					176.09
171	256	-0.13	0.00	0.00	-0.01	-0.135	0.000	0.007	0.009	-4.72	-3.67	1819.87	179.89			-3.66	182.62
		-0.13				-0.135	0.000	0.007	0.009	-4.91		1822.40				-3.87	188.32
173	258	-0.10	0.00	-0.01	-0.01	-0.104	0.000	0.016	0.008	-5.32	-4.55	1823.89	192.01			-4.53	195.06
		-0.10				-0.104	0.000	0.004	0.009	-5.47		1826.23				-4.73	200.96
		-0.10				-0.105		-0.007	0.011	-6.15		1827.57				-5.40	207.86
		-0.09 -0.09				-0.094		-0.008	0.010	-6.31 -6.96		1829.77				-5.61	213.92
		-0.09 -0.08		0.02		-0.094 -0.084		-0.020 -0.020	0.002	-0.90 -7.14		1830.85 1832.81				-6.21 -6.32	221.07 227.40
		-0.05		0.01		-0.053		-0.011	0.001	-7.44		1833.50				-6.70	234.93
		-0.03		0.01		-0.033 -0.032		-0.011	0.001	-7.61		1835.22				-6.70	241.47
	266	0.01		0.00	0.00	0.011	0.000	0.000	0.000			1836.09				-7.45	
182	267	0.00	0.00	0.00	0.00	0.000	0.000	0.000				1837.68				-7.54	255.55
183	268	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-9.08	-8.10	1838.29	258.32			-8.11	263.22
184	269	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.96	-8.00	1839.53	265.16			-8.00	270.26
	270	-0.01		0.00	0.00	-0.011	0.000	0.000				1838.56					279.51
186		0.00		0.00	0.00	0.000	0.000	0.000				1839.01					287.36
	272273	0.01		0.00 -0.01	0.00		-0.054 -0.081	0.001				1837.77 1837.97					296.92 305.07
								0.013									
	274275			-0.02 -0.02	0.00		-0.123 -0.137	0.028 0.028				1837.42 1837.82					314.01 321.96
	276			-0.02 -0.02	0.00		-0.157 -0.150	0.028				1837.82					330.84
	277			-0.02	0.01		-0.164	0.030				1837.54					338.94
	278			-0.01	0.02		-0.162		-0.010								348.11
194	279			-0.01	0.02	0.059	-0.162		-0.010								356.29
	280			-0.05	0.00		-0.168	0.069				1835.56					366.04
	281			-0.05	0.00		-0.168	0.070				1835.44					374.49
197	282	0.10	0.11	-0.05	0.00	0.112	-0.154	0.069	0.017	-4.74	-1.53	1834.42	375.19			-1.18	383.82
	= 86 (0.0-		0	0.25	0.0==	0.0:-	0.011		0	1.40=	2				a= = :
	186	0.30		0.00	0.02	0.329	0.000		-0.014			1407.37	26.61			0.60	27.76
	187 188	0.30		0.00	0.02	0.329 0.330	0.000 0.000		-0.014 -0.018			1417.83 1429.91	24.22 20.21			0.50 0.69	25.26 21.20
	189	0.30		0.01	0.02	0.353	0.000		-0.018 -0.008			1429.91	18.33			0.69	19.21
	190	0.32		0.01	0.01	0.364	0.000		-0.003			1451.47	14.80			0.03	15.62
105		0.28		0.03	0.00	0.308	0.000		-0.006			1460.93	13.41			1.07	14.16
	171	0.20	0.00	0.03	0.00	0.364	0.000	0.036		-1.01 -1.26		1472.16	10.25			1.07	10.93

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 86 ((Rn)															
	193	0.25	0.00	0.03	0.00	0.274	0.000	-0.009	-0.006	-0.56	1.32	1481.40	9.08			1.26	9.72
		-0.23		0.00		-0.237	0.000		-0.002			1492.55	6.01			1.17	6.59
		-0.23		0.00		-0.237	0.000		-0.002			1501.66	4.97	5.07	0.051	0.88	5.48
		-0.22 -0.22		0.00		-0.227 -0.227	0.000 0.000		-0.002 -0.002			1512.49 1521.25	2.20 1.52	1.97 1.48	0.015 0.061	0.72 0.44	2.67 1.92
		-0.22		0.00		-0.227	0.000		-0.002			1531.75	-0.91	-1.23	0.013	0.24	-0.56
		-0.21		0.00		-0.217	0.000	0.017	-0.002	-1.75		1540.26	-1.35	-1.52	0.064	-0.15	-1.05
		-0.20		0.01	0.00	-0.207	0.000	0.004	0.001	-1.90		1550.46	-3.48	-4.01	0.013	-0.41	-3.23
		-0.20		0.01		-0.207	0.000	0.004	0.001	-2.40		1558.71	-3.66	-4.07	0.071	-0.88	-3.46
						-0.115	0.000	0.017	0.008	-2.24		1568.87		-6.28	0.018	-1.43	-5.57
						-0.115 -0.115	0.000 0.000	0.017 0.017	0.008 0.008	-2.92 -3.73		1576.95 1586.94	-5.76 -7.68	-6.16 -7.98	0.024 0.015	-2.07 -2.81	-5.63 -7.58
119						-0.113 -0.104	0.000	0.017	0.008	-3.73 -4.43		1594.83	-7.50	-7.76	0.013	-2.51 -3.58	-7.36 -7.45
120						-0.094	0.000	0.015	0.009	-5.07	-4.26	1604.44		-9.12	0.015	-4.26	-9.01
121	207	-0.08	0.00	0.00	0.00	-0.084	0.000	0.002	-0.000	-5.86	-5.18	1612.16	-8.68	-8.63	0.026	-5.18	-8.70
		-0.06		0.01		-0.063	0.000	-0.010	0.001	-6.48		1621.33		-9.65	0.011	-5.76	-9.83
	209	-0.06		0.01	0.00	-0.063	0.000	-0.010	0.001			1628.63	-9.00	-8.93	0.020	-6.55	-9.08
124	210		0.00 0.00	0.00	0.00 0.00	0.000	0.000	0.000	0.000	-8.04 -9.05		1637.37 1644.50	-9.67 -8.74	-9.60 -8.76	0.009 0.007	-7.01 -7.95	-9.77 -8.86
126			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.30		1652.69		-8.66	0.007	-8.16	-9.00
	213	-0.01		-0.01	0.00	-0.010	0.000	0.012	-0.000	-8.30		1657.65		-5.70	0.006	-7.21	-5.90
	214		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.29		1664.37	-4.39	-4.32	0.009	-6.25	-4.56
	215	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000	-5.95		1668.78	-0.72	-1.17	0.008	-5.03	-0.91
130			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.80		1675.04	1.09	0.26	0.007	-3.91	0.89
131				-0.03	0.00		-0.138	0.041	0.010	-6.69		1679.92	4.28	3.66		-3.36	4.16
132 133				-0.04 -0.05	0.00 -0.01		-0.139 -0.127	0.054 0.067	0.012 0.023	-6.21 -6.10		1686.31 1691.12	5.96 9.22	5.22 8.83	0.002 0.003	-2.62 -2.33	5.87 9.16
	220			-0.05	0.00		-0.127 -0.125	0.067		-5.32		1697.30	11.11	10.61	0.003	-2.53 -1.69	11.05
135				-0.05	0.00		-0.125	0.068		-5.05		1701.86	14.62	14.47	0.006	-1.44	14.56
136	222	0.10	0.09	-0.05	0.00	0.110	-0.125	0.068	0.014	-4.37	-0.93	1707.78	16.77	16.37	0.002	-0.79	16.74
137				-0.06	0.00		-0.126	0.084	0.018			1712.02	20.60			-0.45	20.61
138				-0.06	0.00		-0.112	0.083	0.017	-3.79		1717.76	22.93			0.11	22.96
139 140	225			-0.07 -0.07	0.00 0.00		-0.070 -0.056	0.097 0.097		-3.49 -2.92		1721.89 1727.57	26.88 29.26			0.29 0.65	26.93 29.35
	227			-0.07	0.00		-0.028	0.098		-2.85		1731.66	33.25			0.61	33.35
142	228	0.17	0.00	-0.07	0.01	0.183	0.000	0.100	0.007	-2.53	0.46	1737.43	35.55			0.63	35.68
143	229			-0.06	0.01	0.194	-0.014	0.089	0.006	-2.32		1741.31	39.74			0.53	39.87
	230			-0.06	0.02	0.204	0.000		-0.004			1746.71	42.41			0.70	42.60
145	231			-0.05 -0.05	0.02	0.215 0.226	0.000 -0.027		-0.005 -0.014			1750.56 1755.76	46.63 49.51			0.40 0.56	46.83
				-0.03	0.03		0.000										49.81
147 148	233			-0.04 -0.03	0.03	0.237 0.237	0.000		-0.017 -0.020			1759.44 1764.34	53.89 57.06			0.21 0.37	54.21 57.43
149				-0.03	0.03	0.237	0.000		-0.020			1767.81	61.67			0.04	62.08
	236	0.22	0.00	-0.02	0.03	0.238	0.000		-0.022		0.02	1772.55	65.00			0.15	65.48
151	237	0.22	0.00	-0.01	0.03	0.238	0.000	0.036	-0.025	-2.27	-0.25	1775.74	69.88			-0.13	70.42
152				-0.01	0.03	0.238	0.000		-0.025			1780.14	73.55			0.10	74.17
	239		0.00	0.00	0.02	0.239	0.000		-0.018			1782.81	78.95			0.06	79.56
154 155	240 241		0.00 0.00	0.00	0.02 0.02	0.239 0.240	0.000 0.000		-0.018 -0.021			1786.81 1789.26	83.03 88.64			0.48 0.53	83.72 89.42
	242		0.00	0.01	0.02	0.240	0.000		-0.021 -0.011			1793.06	92.92			0.33	93.73
	243		0.00	0.01	0.01	0.206	0.000		-0.011			1795.59	98.46			0.65	99.36
	244		0.00	0.02	0.00	0.195			-0.003			1799.45				0.77	103.65
159	245	0.18	0.00	0.03	0.00	0.196	0.000	-0.023	-0.005	-1.01	0.49	1801.83	108.36				109.45
	246		0.00	0.03	0.00	0.196			-0.005			1805.63					113.82
161			0.00	0.04	0.00	0.196			-0.007			1808.01					119.64
	248		0.00		-0.01	0.197		-0.047				1811.62					124.26
103	249	0.17	0.00	0.05	-0.01	0.185	0.000	-0.049	0.001	-1.93	-0.32	1813.64	128.83			-0.24	130.41

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 86 ((Rn)															
	250	` ′	0.00	0.04	-0.01	0.174	0.000	-0.038	0.003	-1.43	-0.16	1816.87	133.68			-0.10	135.35
165			0.00		-0.01	0.174		-0.038	0.003			1818.60					141.81
166			0.00	0.01	0.01	0.129		-0.005				1821.95					146.61
167 168		-0.12	0.00	0.01	0.01	0.129 -0.135	0.000 0.000	-0.005 0.018	-0.011 -0.002	-2.05 -2.39		1823.98 1827.26				-1.13 -1.44	152.79 157.69
						-0.135	0.000	0.019	0.002			1829.17				-2.15	164.00
						-0.135 -0.135	0.000	0.019	0.008	-3.13 -3.45		1832.22				-2.13 -2.37	169.17
						-0.135	0.000	0.019	0.008	-4.11		1833.83					175.77
						-0.125	0.000	0.018	0.008			1836.63				-3.11	181.20
						-0.104	0.000	0.016	0.008			1838.24				-3.87	187.82
		-0.10				-0.104	0.000	0.004	0.009	-4.76		1840.89				-4.05	193.39
		-0.10 -0.09				-0.104 -0.094	0.000 0.000	0.004 -0.008	0.009 0.010	-5.41 -5.55		1842.22 1844.73				-4.70 -4.89	200.29 206.03
		-0.09				-0.094		-0.008	0.010			1845.83					213.17
178	264	-0.08	0.00	0.01	-0.01	-0.084	0.000	-0.009	0.010	-6.24	-5.56	1848.03	215.51			-5.53	219.22
179	265	-0.07	0.00	0.01	0.00	-0.073	0.000	-0.010	0.001	-6.66	-6.00	1848.83	222.78			-6.00	226.64
		-0.04		0.01		-0.042	0.000	-0.011	0.001			1850.71				-5.89	233.03
181			0.00	0.00	0.00	0.000	0.000	0.000	0.000			1851.43				-6.41	240.57 246.86
182 183			0.00	0.00	0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000			1853.39 1854.02				-0.30 -7.13	254.51
184			0.00	0.00	0.00	0.000	0.000	0.000	0.000	−7.91		1855.55				-6.99	261.26
	271	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000			1854.58					270.51
186	272	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.26	-5.39	1855.37	272.75			-5.40	277.99
187			0.05	0.00	0.00		-0.067	0.001	0.002	-5.67		1854.19				-4.42	
188				-0.01	0.00		-0.095	0.014	0.004			1854.77					295.27
189				-0.02	0.00		-0.123	0.028	0.007			1854.27				-3.39	304.14
190 191				-0.02 -0.02	0.00		-0.137 -0.150	0.028 0.030	0.008 -0.000	-5.50 -5.83		1855.01 1854.52				-2.88 -2.89	311.74 320.56
192				-0.02	0.02		-0.163		-0.009			1855.34				-2.54	328.14
193	279	0.05	0.12	-0.01	0.02	0.059	-0.162	0.018	-0.010	-5.36	-2.67	1854.48	330.13			-2.36	337.29
194				-0.01	0.02	0.060	-0.176	0.019	-0.008			1854.83				-1.73	345.31
195				-0.05	0.00		-0.168	0.070	0.019			1853.71				-1.36	354.80
196 197	282			-0.05 -0.06	0.00		-0.168 -0.099	0.070 0.080				1854.08 1852.80					362.78 372.39
198				-0.05			-0.154	0.069				1853.15					380.35
199		0.11	0.02	-0.08	-0.02	0.121	-0.029	0.105	0.035	-3.20	-0.89	1852.32	380.72				389.85
200				-0.08		0.153	0.000	0.108				1852.34				0.20	398.05
Z :	= 87 ((Fr)															
102			0.00	0.01	0.02	0.341	0.000	0.033	-0.018	-2.04	0.40	1427.59	29.83			0.27	30.97
103	190		0.00	0.00	0.02	0.352	0.000		-0.013			1438.02	27.46			0.26	28.50
104			0.00	0.00	0.02	0.363	0.000		-0.013			1449.70	23.86			0.49	24.83
105 106			0.00	0.01	0.01	0.364	0.000		-0.007			1459.64	21.99			0.57	22.87
			0.00	0.01	0.00	0.364	0.000	0.036		-1.57		1470.88	18.82			0.84	19.65
107 108		0.27 0.32			-0.01 -0.01	0.297 0.353	0.000 0.000	-0.006 0.019	0.003 0.008	-0.85 -1.04		1480.39 1491.28	17.38 14.56			1.00 1.20	18.15 15.26
		-0.24				-0.247	0.000	0.023		-0.93		1500.80	13.12			1.00	13.77
110	197	-0.24	0.00			-0.247	0.000	0.023		-1.08		1511.67	10.32			0.86	10.92
111	198	-0.23	0.00	0.00	0.00	-0.237	0.000	0.020	-0.002	-1.21	0.66	1520.83	9.23			0.60	9.76
		-0.23		0.00		-0.237	0.000		-0.002			1531.35	6.78	6.76	0.042	0.44	7.26
		-0.22		0.00		-0.227	0.000		-0.002			1540.23	5.96	6.12	0.078	0.11	6.39
		-0.21 -0.21		0.01 0.01		-0.217 -0.217	0.000 0.000	0.006				1550.45 1559.12	3.82 3.22	3.60 3.14	0.071 0.049	-0.10 -0.57	4.20 3.54
		-0.21 -0.20		0.01		-0.217 -0.207	0.000					1569.13	1.28	0.86		-0.93	1.56
		-0.19		0.02		-0.197		-0.009				1577.44	1.04	0.61		-1.36	1.27
						-0.125	0.000	0.018				1587.64				-2.24	-0.87
						-0.125	0.000	0.018				1595.87				-2.92	-1.08
120	207	-0.11	0.00	-0.01	-0.01	-0.115	0.000	0.017	0.008	-4.53	-3.57	1605.48	-2.79	-2.84	0.051	-3.57	-2.66

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 87 ((Fr)															
		-0.09	0.00	0.00	0.00	-0.094	0.000	0.003	-0.000	-5.10	-4.40	1613.55	-2.78	-2.66	0.047	-4.41	-2.69
122	209	-0.08	0.00	0.00	0.00	-0.084	0.000	0.002	-0.000	-5.60	-4.93	1622.71	-3.87	-3.77	0.015	-4.93	-3.82
		-0.06	0.00	0.01	0.00	-0.063	0.000	-0.010	0.001	-6.39		1630.40	-3.48	-3.35	0.022	-5.69	-3.46
124		0.01		0.00	0.00	0.011	0.000	0.000	0.000	-6.97		1639.09	-4.11	-4.16	0.021	-6.06	-4.11
125		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-7.95		1646.55	-3.49	-3.54	0.026	-6.90	-3.52
126		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.20		1654.78		-3.55	0.008	-7.12	-3.70
127 128		-0.01 0.00		-0.01 0.00	0.00 0.00	-0.010 0.000	0.000 0.000	0.012	-0.000 0.000	-7.19 -6.21		1660.15 1666.93	-0.95 0.34	-0.96 0.32	0.009 0.007	-6.17 -5.24	-1.02 0.25
129			0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.93		1671.86	3.48	2.98	0.007	-3.24 -4.13	3.37
130					-0.01		-0.126	0.054	0.021	-6.58		1678.50	4.91	4.32		-3.26	4.88
131	218	0.08	0.10	-0.04	0.00	0.090	-0.139	0.055	0.012	-6.65	-3.07	1683.97	7.51	7.06	0.005	-2.99	7.46
132				-0.05	0.00	0.100	-0.140	0.068	0.014	-6.40		1690.53	9.02	8.62	0.007	-2.37	9.00
133				-0.06	-0.01		-0.127	0.081	0.026			1695.89	11.74	11.48	0.004	-2.23	11.74
134				-0.06	0.00		-0.140	0.081	0.017	-6.12		1702.18	13.52	13.28		-1.65	13.52
135				-0.06	0.00		-0.141	0.082	0.018	-6.01		1707.19	16.58	16.35	0.021	-1.45	16.58
136				-0.06	0.01		-0.139	0.083	0.008	-5.34		1713.22	18.62	18.38	0.002	-0.88	18.65
137 138				-0.06 -0.06	0.01		-0.139 -0.125	0.084 0.085	0.009	-5.26 -4.38		1717.98 1723.73	21.93 24.25	21.66 23.81	0.050 0.030	-0.70 -0.11	21.96 24.30
139				-0.07	0.00		-0.084	0.097	0.019	-4.01		1728.29	27.76	27.37	0.100	0.02	27.82
140	227	0.15	0.05	-0.07	0.00	0.163	-0.070	0.097	0.018	-3.38		1733.98	30.14	29.66	0.100	0.41	30.24
141	228	0.16	0.03	-0.07	0.00	0.173	-0.042	0.098	0.018	-3.22	-0.05	1738.73	33.47			0.10	33.57
142	229	0.18	0.00	-0.07	0.01	0.194	0.000	0.102	0.009	-2.92	0.21	1744.29	35.98	35.82	0.037	0.36	36.11
143				-0.07	0.02	0.205	0.000	0.104	-0.001	-3.16		1748.63	39.71			0.23	39.87
144				-0.06	0.02	0.215	0.000		-0.002	-2.64		1754.00	42.41			0.41	42.59
145				-0.06	0.03	0.226	0.000		-0.012			1758.31	46.17			0.09	46.41
146				-0.05	0.03	0.226	-0.027		-0.014			1763.45	49.11			0.28	49.38
147 148				-0.04 -0.04	0.03	0.237 0.237	0.000 0.000		-0.017 -0.017			1767.48 1772.44	53.14 56.26			-0.05 0.11	53.43 56.60
149				-0.03	0.03	0.237	0.000		-0.020	-2.65		1776.25	60.52			-0.21	60.89
150				-0.02	0.03	0.238	0.000		-0.022	-2.29		1780.97	63.87			-0.06	64.30
151	238	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-2.57	-0.44	1784.53	68.38			-0.34	68.85
152	239	0.22	0.00	-0.01	0.03	0.238	0.000	0.036	-0.025	-2.17	-0.19	1788.93	72.05			-0.09	72.60
153			0.00	0.00	0.02	0.239	0.000		-0.018			1791.93	77.13			-0.07	77.67
154			0.00	0.00	0.02	0.239	0.000		-0.018				81.18			0.35	81.81
155		0.22		0.01	0.02	0.240	0.000		-0.021			1798.66	86.54			0.50	87.23
156 157		0.20	0.00	0.01	0.01	0.217 0.206	0.000 0.000		-0.011 -0.011			1802.53 1805.42	90.73 95.92			0.80 0.58	91.47 96.74
158		0.19		0.01	0.00	0.200	0.000		-0.011			1809.23				0.36	101.07
159		0.18		0.02	0.00	0.195		-0.010				1811.99					106.48
160	247	0.18	0.00	0.03	0.00	0.196	0.000	-0.023	-0.005	-0.89	0.52	1815.74	109.81			0.53	110.90
161	248	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	-1.44	0.09	1818.45	115.18			0.12	116.39
162		0.18		0.05	0.00	0.197		-0.046				1822.04					121.01
163			0.00	0.05	-0.01	0.185		-0.049				1824.41					126.82
164 165			0.00 0.00	0.04	0.00 -0.01	0.174 0.174		-0.037 -0.038				1827.65 1829.69					131.73 137.88
166 167		0.12 0.12		0.01	0.01	0.129 0.129						1832.98 1835.30					142.74 148.62
		-0.12		0.01		-0.176		-0.000				1838.61					153.47
		-0.17		0.01		-0.176		-0.000				1840.85					159.44
						-0.135	0.000	0.019			-2.09	1843.92	162.35			-2.07	164.60
171	258	-0.13	0.00	-0.01	-0.01	-0.135	0.000	0.019	0.008	-3.79	-2.68	1845.86	168.48			-2.66	170.87
						-0.125	0.000	0.018	0.008			1848.80					176.14
						-0.125	0.000	0.018	0.008			1850.53					182.63
						-0.104	0.000	0.016				1853.18					188.21
		-0.10				-0.104	0.000	0.004				1854.82				-4.27	194.79
		-0.10		0.01 0.02		-0.105 -0.094		-0.007 -0.020				1857.30					200.55
1//	∠04	-0.09	0.00	0.02	0.00	-0.094	0.000	-0.020	0.002	-3./1	-3.03	1858.75	204.01			-3.03	207.33

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 87 ((Fr)															
		-0.08	0.00	0.02	0.00	-0.084	0.000	-0.021	0.002	-5.78	-5.09	1860.95	209.88			-5.08	213.37
		-0.07		0.02		-0.073		-0.021	0.002	-6.23		1862.09				-5.53	220.47
		-0.04		0.02		-0.042	0.000	-0.023	-0.009			1863.93				-5.35	226.90
	268		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1864.87				-5.80	
	269		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1866.82				-5.93	240.48
	270		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-7.36		1867.75				-6.47	247.82
184	271	-0.00	0.00	0.00	0.00	0.000 -0.011	0.000 0.000	0.000 0.000	0.000 0.000	-7.22 -6.28		1869.27 1868.61				-6.32 -5.44	254.56 263.49
	273		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1869.43					270.95
187	274		0.05	0.00	0.00		-0.067	0.001	0.002			1868.54				-3.73	280.16
188	275	0.03	0.07	-0.01	0.00	0.034	-0.095	0.014	0.004	-4.58	-3.04	1869.18	282.37			-2.95	287.86
	276			-0.02	0.00		-0.123	0.028	0.007	-5.18		1869.11				-2.89	296.27
	277			-0.02	0.01		-0.150	0.030	-0.000			1869.95				-2.44	303.80
	278279			-0.02 -0.02	0.01		-0.164 -0.163	0.031 0.031	0.002 -0.009	-5.86 -5.34		1869.99 1870.65				-2.67 -2.19	312.08 319.78
	280				0.02		-0.103 -0.176		-0.009 -0.008							-2.19 -2.03	328.59
	281			-0.01 -0.01	0.02		-0.176 -0.176	0.020	-0.008	-3.47 -4.79		1870.15 1870.47				-2.03 -1.40	328.39
	282			-0.06	0.02		-0.154	0.082	0.019	-5.22		1869.98				-1.31	345.49
196	283	0.10	0.11	-0.06	0.00	0.112	-0.154	0.082	0.019	-4.75	-1.30	1870.36	345.76			-0.88	353.45
197	284	0.12	0.11	-0.06	0.01	0.133	-0.154	0.084	0.010	-4.57	-1.09	1869.53	354.67			-0.71	362.56
	285			-0.06	0.01		-0.154	0.084	0.010	-4.18		1869.82				-0.33	370.61
	286			-0.08	-0.01		-0.042	0.107	0.027	-3.28		1868.93				-0.03	379.99
	287 288			-0.08 -0.08	-0.01 0.00	0.153 0.163	0.000 0.000	0.108 0.109	0.028 0.018	-3.06 -3.21		1869.32 1868.57				0.11 -0.11	387.95 396.95
	289			-0.08	0.00	0.163	0.000	0.109				1868.88				-0.11	405.01
	= 88 (0.00	0.00	0.02	0.262	0.000	0.051	0.012	2.02	0.52	1440.22	21.52			0.41	22.70
	192 193		0.00 0.00	0.00	0.02	0.363 0.364	0.000 0.000		-0.013 -0.007	-2.02 -1.78		1449.33 1459.30	31.52 29.62			0.41 0.51	32.70 30.70
	194		0.00	0.01	0.01	0.364	0.000		-0.007	-1.48		1470.97	26.02			0.80	27.04
	195		0.00	0.02	0.00	0.285	0.000		-0.003	-0.66		1480.45	24.61			1.06	25.58
108	196	0.32	0.00	0.02	-0.01	0.353	0.000	0.019	0.008	-0.92	1.29	1491.84	21.29			1.20	22.17
	197		0.00		-0.01	0.342	0.000	0.016	0.008	-0.81		1500.96	20.24			1.40	21.04
	198	-0.24			-0.01	-0.247	0.000	0.023	0.007	-0.52		1512.17	17.10			1.40	17.88
		-0.24 -0.23		0.00		-0.247 -0.237	0.000 0.000		-0.002 -0.002	-0.79 -0.82		1521.38 1532.33	15.96 13.08			1.15 0.99	16.66 13.73
		-0.23 -0.23		0.00		-0.237 -0.237	0.000	0.020	-0.002	-0.82 -1.15		1532.33	12.25			0.70	12.83
		-0.22		0.01		-0.227	0.000	0.007	0.001	-1.23		1551.88	9.68	9.21	0.063	0.49	10.21
		-0.21		0.01		-0.217	0.000	0.006	0.001	-1.59		1560.56	9.07	8.64	0.081	0.07	9.55
		-0.20		0.02		-0.207	0.000	-0.007	0.003	-1.88		1571.04	6.66	6.05	0.015	-0.33	7.09
		-0.19		0.02		-0.197	0.000	-0.009	0.003	-2.39		1579.53	6.25	5.84	0.086	-0.89	6.62
						-0.125	0.000	0.018	0.008	-2.49		1589.89	3.96	3.57	0.018		4.30
						-0.125	0.000	0.018	0.008			1598.17	3.75	3.54		-2.19	4.05
		-0.12 -0.10				-0.125 -0.104	0.000 0.000	0.018 0.004	0.008			1608.11 1616.21	1.87 1.85	1.71 1.86	0.015 0.050	-2.75 -3.57	2.13 2.06
		-0.10 -0.08		0.00		-0.104 -0.084	0.000		0.009			1625.80	0.33	0.46	0.030	-3.37 -4.10	0.50
		-0.07		0.01		-0.073		-0.010	0.001			1633.51	0.70	0.84		-4.84	0.83
		-0.05		0.01		-0.053	0.000	-0.011	0.001			1642.66	-0.39	-0.19	0.011	-5.26	-0.28
	213		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1650.01	0.34	0.36	0.020	-5.94	0.41
	214		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1658.64	-0.22	0.10	0.009	-6.15	-0.18
	215				0.00		0.000	0.012	-0.000			1664.10	2.39	2.53	0.008	-5.24	2.41
	216		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1671.25	3.30	3.29	0.009	-4.28	3.30
	217			-0.03	0.00		-0.110	0.039	0.007			1676.29	6.34	5.89	0.009	-3.19	6.36
	218 219			-0.04 -0.04	0.00		-0.125 -0.139	0.054 0.055				1683.49 1689.10	7.21 9.67	6.65 9.39	0.011	-2.53 -2.34	7.24 9.70
	220			-0.04	-0.00		-0.139 -0.127	0.033				1696.15	10.70	10.27	0.009	-2.34 -1.78	10.78
	221			-0.06	0.00		-0.140	0.081				1701.59	13.32	12.96		-1.72	13.39
134	222	0.11	0.10	-0.06	0.00	0.122	-0.141	0.082	0.018	-5.75	-1.36	1708.36	14.63	14.32	0.005	-1.21	14.71

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	EFL mic (MeV)	M _{th} FL (MeV)
7	= 88 ((Da)															
135			0.10	-0.06	0.01	0.132	-0.139	0.083	0.008	-5.58	-1.26	1713.50	17.56	17.24	0.003	-1.12	17.62
136				-0.06	0.01		-0.139	0.084	0.009	-5.16		1720.00	19.13	18.83	0.002	-0.61	19.21
137				-0.06	0.01		-0.139	0.085	0.010	-5.13		1724.85	22.35	21.99	0.003	-0.48	22.43
138				-0.07	0.01		-0.112	0.098	0.010	-4.46		1731.08	24.19	23.67	0.002	0.03	24.31
139				-0.07	0.01		-0.097	0.099	0.010	-4.17		1735.70	27.64	27.18	0.002	0.13	27.75
140 141				-0.07 -0.08	0.01		-0.083 -0.028	0.099 0.113	0.009 0.011	-3.57 -3.72		1742.06 1746.67	29.36 32.81	28.94 32.56	0.002	0.23 0.11	29.49 32.97
	230			-0.08 -0.07	0.01	0.184	-0.028 0.000	0.113	0.011	-3.72 -3.07		1740.07	34.85	34.52	0.019	0.11	35.01
143				-0.07	0.02	0.205	0.000	0.104	-0.001	-3.34		1757.18	38.45			0.02	38.64
144	232	0.20	0.00	-0.06	0.02	0.215	0.000	0.093	-0.002	-2.84	0.05	1762.95	40.75			0.19	40.95
145				-0.06	0.03	0.226	0.000		-0.012			1767.24	44.53			-0.08	44.78
146				-0.05	0.03	0.237	0.000		-0.014			1772.77	47.08			0.09	47.35
147 148				-0.04 -0.04	0.03	0.237 0.237	0.000 0.000		-0.017 -0.017			1776.83 1782.16	51.08 53.83			-0.23 -0.07	51.37 54.17
149				-0.04	0.03	0.237	0.000		-0.017 -0.020	-2.73 -2.82		1785.98	58.08			-0.38	58.44
150				-0.02	0.03	0.249	0.000		-0.022	-2.56		1791.06	61.06			-0.22	61.48
151				-0.01	0.03	0.250	0.000		-0.025	-2.72		1794.65	65.55			-0.49	66.01
152	240	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-2.42	-0.34	1799.41	68.86			-0.23	69.39
153				-0.01	0.03	0.238	0.000			-2.24		1802.45	73.89			-0.17	74.48
154		0.22		0.00	0.02	0.239	0.000			-1.56		1806.78	77.63			0.24	78.23
155		0.22		0.01	0.02	0.240	0.000		-0.021	-1.44		1809.53	82.96			0.38	83.61
156 157		0.22		0.01 0.01	0.01 0.01	0.239 0.217	0.000 0.000		-0.011 -0.011	-0.93 -0.96		1813.68 1816.56	86.87 92.07			0.77 0.57	87.57 92.83
158		0.20		0.01	0.01	0.217	0.000		-0.011	-0.65		1820.70	96.00			0.80	96.85
159		0.18		0.02	0.00	0.195	0.000		-0.003	-0.81		1823.41				0.57	102.28
160	248	0.19	0.00	0.03	0.00	0.207	0.000	-0.021	-0.006	-0.85	0.57	1827.56	105.28			0.59	106.31
161	249	0.18	0.00	0.04	0.00	0.196		-0.034		-1.31		1830.19				0.26	111.86
162		0.19		0.05	0.00	0.208		-0.045		-1.55		1834.12				0.33	116.13
163		0.18		0.05	-0.01	0.197		-0.047		-1.70		1836.47				0.07	121.95
164		0.16		0.04	0.00	0.174			-0.007			1840.05				0.23	126.53
165 166		0.16 0.12		0.04 0.01	-0.01 0.01	0.174 0.129		-0.038 -0.005		-1.35 -0.76		1842.07 1845.56				0.11 0.16	132.68 137.34
167		0.12		0.01	0.01	0.129			-0.011	-0.70 -1.34		1847.88				-0.44	143.21
168		0.12		0.01	0.01	0.129			-0.011		-0.66	1851.45	145.96				147.83
169	257	-0.13	0.00	-0.01	-0.01	-0.135	0.000	0.019	0.008	-2.35	-1.41	1853.74	151.74			-1.39	153.72
170	258	-0.13	0.00	-0.01	-0.01	-0.135	0.000	0.019	0.008	-2.62	-1.60	1857.12	156.43			-1.58	158.55
						-0.135	0.000	0.019	0.008			1859.05				-2.14	
		-0.17				-0.176 -0.125	0.000 0.000	0.001	0.010	-3.75 -3.81		1862.24 1863.98					169.83 176.31
		-0.12 -0.10				-0.123 -0.104	0.000	0.018 0.004	0.008	-3.68		1866.95				-2.67 -3.01	181.56
		-0.10				-0.104	0.000	0.004	0.009	-4.30		1868.61					188.11
		-0.10				-0.105		-0.007	0.011	-4.46		1871.43				-3.81	193.52
177	265	-0.10	0.00	0.02		-0.105	0.000	-0.019	0.002	-5.05		1872.84				-4.36	200.34
		-0.09		0.02		-0.094		-0.020	0.012	-5.10		1875.38				-4.39	
		-0.07		0.02		-0.073		-0.021				1876.43					213.21
		-0.04		0.01		-0.042		-0.011				1878.48					219.40
181		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.78		1879.48				-4.98 5.00	226.63
182 183		0.00 0.00		0.00	0.00	0.000 0.000	0.000 0.000	0.000	0.000	-5.91 -6.47		1881.74 1882.66				-5.08 -5.61	
184		0.00		0.00	0.00	0.000	0.000	0.000	0.000			1884.48					246.40
	273	-0.01		0.00	0.00	-0.011	0.000	0.000	0.000			1883.83				-4.56	
186		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-4.66		1884.98				-3.87	262.43
187				-0.01	0.00		-0.081	0.013	0.003	-4.34		1884.19				-2.93	271.55
188				-0.01	0.00		-0.109	0.015	0.005	-4.07		1885.20				-2.20	
189				-0.02	0.00		-0.137	0.029	0.009	-4.83		1885.20					287.23
190				-0.03	0.01		-0.151 -0.163	0.042	0.001			1886.56				-1.94	
191	219	0.06	0.12	-0.02	0.02	0.069	-0.163	0.031	-0.009	-3.22	-2.32	1886.48	290.38			-2.03	302.04

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 88 ((Ra)															
192	280	0.06		-0.02	0.02		-0.163	0.031				1887.41					310.01
193 194				-0.02 -0.05	0.02		-0.177 -0.168	0.032 0.070	-0.007 0.019	-4.99 -4.85		1886.95 1887.64				-1.42 -0.80	318.79 326.46
195				-0.06	0.00		-0.154	0.070	0.019			1887.19					335.24
196	284	0.10	0.11	-0.06	0.00	0.112	-0.154	0.082	0.019	-4.28		1887.85				-0.35	342.91
197 198				-0.06 -0.06	0.01		-0.154 -0.153	0.084	0.010 0.010	-4.24 -3.93		1887.20 1887.85				-0.36 -0.04	351.84 359.52
198			0.00	-0.06 0.11	0.01 -0.03	0.144	-0.155 0.000	0.084 -0.073	-0.010	-3.93 -3.98		1886.64				-0.04 0.18	368.81
200				-0.08	-0.01		-0.014	0.108	0.028	-2.84		1887.67				0.39	376.52
201				-0.08	0.00		-0.014	0.109	0.018	-3.06		1886.99				0.10	385.44
202 203				-0.08 -0.08	0.00	0.163 0.173	0.000 -0.014	0.109 0.111	0.018	-2.91 -3.23		1887.60 1887.04				0.20 -0.28	393.19 402.06
204				-0.07	0.01		-0.028	0.098	0.007	-2.72		1887.42				-0.19	409.93
$oldsymbol{Z}$:	= 89 ((Ac)															
106		0.32		0.00	0.01	0.352	0.000	0.047		-1.63		1468.68	35.60			0.51	36.79
107 108		0.31		0.01 0.01	0.00	0.341	0.000 0.000	0.030 0.030	0.002 0.002	-1.37 -1.08		1478.63 1489.95	33.72 30.47			0.71 1.01	34.83 31.51
109		0.30		0.01	-0.00	0.330	0.000	0.026	0.011	-0.91		1499.55	28.94			1.18	29.91
110	199	0.31	0.00	0.02	-0.01	0.342	0.000	0.016	0.008	-0.64	1.51	1510.55	26.01			1.41	26.92
		-0.24 -0.24		0.00		-0.247 -0.247	0.000 0.000	0.022 0.022	-0.002 -0.002	-0.67 -0.76		1520.19 1531.06	24.45 21.64			1.20 1.18	25.31 22.44
		-0.24 -0.24		0.00		-0.247 -0.247	0.000	0.022	-0.002 -0.002	-0.76 -1.15		1540.44	20.34			0.84	21.06
		-0.23		0.02		-0.237		-0.002	0.003	-1.17		1551.07	17.78			0.70	18.45
		-0.21		0.02		-0.217		-0.005	0.003	-1.33		1560.10	16.82			0.37	17.44
		-0.21 -0.20		0.03		-0.217 -0.207		-0.016 -0.018	0.006	-1.69 -2.19		1570.53 1579.48	14.46 13.58	13.51	0.070	0.05 -0.54	15.02 14.08
118	207	-0.19	0.00	0.03	0.00	-0.197	0.000	-0.020	0.005	-2.64	-0.98	1589.73	11.40	11.13	0.052	-1.01	11.87
		-0.12		-0.01		-0.125 -0.125	0.000	0.018 0.018	0.008 0.008	-2.66 -3.24		1598.43 1608.42	10.77 8.85	10.76 8.84	0.056 0.051	-1.67 -2.22	11.20 9.24
		-0.12 -0.11				-0.125 -0.115	0.000	0.005	0.009	-3.24 -3.79		1616.83	8.52	8.79	0.051	-2.22 -2.94	8.85
		-0.09				-0.094	0.000	0.004	0.009	-4.04		1626.36	7.06	7.20	0.071	-3.36	7.36
		-0.08 -0.06		0.01		-0.084		-0.009 -0.010	0.001 -0.009			1634.47	7.02	7.28	0.068	-4.09 -4.40	7.28
	214	0.00		0.01	0.00	-0.063 0.000	0.000	0.000				1643.58 1651.29	5.99 6.34	6.16 6.43	0.032		6.21 6.53
126	215	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.23	-5.25	1659.96	5.74	6.01	0.021	-5.25	5.89
	216	-0.02			0.00	-0.021	0.000	0.012	-0.000			1665.82	7.95	8.12	0.027	-4.34	8.08
128 129			0.00	0.00 -0.04	0.00	0.000 0.078	0.000 -0.125	0.000 0.054	0.000			1673.05 1678.92	8.79 11.00	8.71 10.84	0.013 0.051	-3.40 -2.74	8.89 11.12
130				-0.04	0.00		-0.139	0.055	0.012			1686.29	11.70	11.57	0.050		11.82
131				-0.05	0.00		-0.140	0.068	0.014			1692.38	13.69	13.75	0.015		13.80
132 133				-0.05 -0.06	0.00		-0.140 -0.141	0.069 0.082	0.015 0.018			1699.55 1705.44	14.59 16.77	14.52 16.62	0.050 0.005	-1.67 -1.63	14.70 16.89
134				-0.06	0.00		-0.140	0.083	0.019			1712.34	17.94	17.83	0.007	-1.22	18.07
135				-0.06	0.01		-0.153	0.084	0.010	-6.17		1717.94	20.40	20.24	0.004	-1.19	20.52
136 137				-0.06 -0.06	0.01		-0.139 -0.139	0.084 0.085	0.009 0.010	-5.26 -5.29		1724.51 1729.80	21.90 24.69	21.64 24.31	0.005 0.003	-0.73 -0.64	22.03 24.81
137				-0.00 -0.07	0.01		-0.139 -0.112	0.083	0.010			1729.80	26.44	25.85	0.003	-0.04 -0.19	26.58
139				-0.07	0.01		-0.097	0.099	0.010			1741.37	29.26	28.90	0.003	-0.33	29.40
140				-0.08	0.00		-0.028	0.113	0.021			1747.60	31.11	30.75	0.033	-0.03	31.29
141 142				-0.08 -0.07	0.01	0.195	-0.028 0.000	0.115 0.103	0.012 0.010			1752.67 1758.76	34.11 36.09	33.81 35.92	0.300 0.100	-0.25 -0.13	34.28 36.26
143	232	0.20	0.00	-0.07	0.02	0.215	0.000	0.106	0.001	-3.90	-0.50	1763.62	39.30	39.15	0.100	-0.37	39.49
144				-0.06	0.02	0.226	0.000		-0.001 -0.012	-3.37		1769.41	41.58			-0.19	41.78
145 146				-0.06 -0.05	0.03	0.226 0.237	0.000		-0.012 -0.014				44.98 47.46			-0.46 -0.32	45.23 47.73
140				-0.05 -0.05	0.03	0.237	0.000		-0.014 -0.014				51.11			-0.52 -0.61	51.40
148	237	0.22	0.00	-0.04	0.03	0.237	0.000	0.073	-0.017	-3.09	-0.54	1789.41	53.87			-0.43	54.19

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	\mathcal{E}_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 89 ((Ac)															
149	238	0.23	0.00	-0.03	0.03	0.249	0.000	0.062	-0.019	-3.27	-0.82	1793.60	57.75			-0.73	58.09
150	239	0.23	0.00	-0.02	0.03	0.249	0.000	0.050	-0.022	-2.88	-0.63	1798.68	60.74			-0.54	61.13
	240			-0.02	0.03	0.249	0.000		-0.022	-3.15		1802.63	64.86			-0.81	65.29
152				-0.01	0.03	0.250	0.000		-0.025	-2.71		1807.39	68.17			-0.52	68.66
	242			-0.01	0.03	0.238	0.000		-0.025	-2.50		1810.79	72.84			-0.45	73.38
	243		0.00	0.00	0.02	0.239	0.000		-0.018			1815.12	76.58			-0.02	77.13
	244 245		0.00 0.00	0.00 0.01	0.02	0.239 0.239	0.000 0.000		-0.018 -0.011	-1.65 -1.09		1818.18 1822.33	81.60 85.51			0.18 0.59	82.20 86.15
	246		0.00	0.01	0.01	0.217	0.000		-0.011	-1.13		1825.56	90.35			0.40	91.06
158	247	0.19	0.00	0.01	0.01	0.206	0.000		-0.011	-0.82		1829.73	94.26			0.63	95.05
159	248	0.19	0.00	0.02	0.00	0.206	0.000	-0.009	-0.003	-0.98	0.49	1832.71	99.35			0.48	100.20
160	249	0.19	0.00	0.03	0.00	0.207	0.000	-0.021	-0.006	-0.90	0.61	1836.77	103.36			0.62	104.31
	250		0.00	0.04	0.00	0.207		-0.033		-1.41		1839.85				0.19	109.40
162			0.00	0.04	0.00	0.207		-0.033		-1.34		1843.72					113.70
	252		0.00	0.05	-0.01	0.197		-0.047	0.000	-1.67		1846.39					119.22
	253 254	0.16		0.04	0.00		-0.014		-0.007 -0.007	-1.08		1849.95 1852.34					123.82 129.59
	255	0.16	0.01	0.04	0.00		-0.014 -0.014		-0.007 -0.010	-1.50 -0.58		1852.34				0.17 0.36	129.39
	256	0.12		0.00	0.01	0.129	-0.014		-0.010			1858.35					139.90
		-0.18		0.01		-0.186	0.000	0.001	0.001	-1.70		1861.90				-0.40	144.52
169	258	-0.17	0.00	0.01	0.00	-0.176	0.000	-0.000	0.001	-2.37	-1.20	1864.59	148.18			-1.21	150.01
170	259	-0.17	0.00		-0.01	-0.176	0.000	0.001	0.010	-2.67	-1.39	1867.99	152.85			-1.38	154.83
171		-0.17				-0.176	0.000	0.001	0.010	-3.34		1870.29				-1.98	160.72
172		-0.17				-0.176	0.000	0.001	0.010	-3.44		1873.38				-2.04	165.84
173		-0.12				-0.125	0.000	0.018	0.008			1875.41					172.02
		-0.12				-0.125	0.000	0.018	0.008	-3.44		1878.28					177.36
175		-0.10 -0.10		0.00 0.01		-0.104 -0.105	0.000	0.004 -0.008	0.009 0.001	-3.88 -4.00		1880.33 1883.14				-3.26 -3.41	183.51 188.91
177		-0.10		0.01		-0.105		-0.008 -0.019	0.001	-4.60		1884.88				-3.41 -3.95	195.40
		-0.09		0.02		-0.094		-0.020	0.012	-4.60		1887.39				-3.93	201.16
179	268	-0.08	0.00	0.02	0.00	-0.084	0.000	-0.021	0.002	-4.97	-4.32	1888.76	204.72			-4.30	207.98
180	269	-0.04		0.01		-0.042		-0.011	0.001	-4.65		1890.75				-3.97	214.22
	270	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000			1892.07				-4.43	221.13
	271		0.00	0.00	0.00	0.011	0.000	0.000				1894.32					227.13
	272		0.00	0.00	0.00	0.011	0.000	0.000	0.000	-5.87	-5.02	1895.54	230.23				234.15
	273	0.00		0.00	0.00	0.000	0.000	0.000				1897.37					240.57
	274	-0.01		0.00	0.00	-0.011	0.000	0.000				1897.06					249.14
	275276		0.00 0.05	0.00	0.00	0.000	0.000 -0.067	0.000 0.001				1898.20 1897.73					256.26 265.04
	277			-0.02	0.00		-0.123	0.028				1898.92					272.23
	278	0.06	0.10	-0.03	0.00	0.068	-0.138	0.041				1899.45					280.02
	279			-0.03	0.01		-0.150	0.042				1900.70					287.08
191	280	0.06	0.12	-0.02	0.02		-0.163	0.031	-0.009	-4.92	-2.00	1900.92	289.42			-1.73	295.18
	281			-0.02	0.02		-0.163		-0.009								302.53
	282			-0.02	0.02		-0.177		-0.007								311.00
	283			-0.05	0.01		-0.167	0.070				1902.58					318.47
	284			-0.05	0.01		-0.167	0.070				1902.38					326.96
	285 286		0.00 0.00		-0.02 -0.02	0.432 0.420			-0.018 -0.018								334.50 342.99
	287		0.00		-0.02 -0.02	0.420			-0.018 -0.018								350.60
	288		0.00		-0.03	0.433			-0.014							-0.06	
	289		0.00		-0.03	0.434			-0.014 -0.018								367.24
	290		0.00		-0.03	0.434			-0.018								375.82
	291			-0.08	0.01		-0.014	0.111				1904.31					383.35
203	292	0.16	0.01	-0.08	0.01	0.173	-0.014	0.111	0.009	-3.48	-1.06	1903.99	383.20			-0.64	391.99
	293	0.17	0.01	-0.07	0.01	0.183	-0.014	0.100	0.008	-3.02	-0.75	1904.24	391.02			-0.43	399.98
205	294	0.18	0.01	-0.07	0.02	0.193	-0.014	0.102	-0.002	-3.45	-1.16	1903.82	399.51			-0.82	408.77

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	EFL mic (MeV)	M _{th} FL (MeV)
	= 89 ((Ac)															
206			0.00	-0.07	0.02	0.193	0.000	0.102	-0.002	-3.39	-1.04	1904.15	407.26			-0.69	416.81
Z :	= 90 ((Th)															
108		0.26	0.00	0.02	0.00	0.285	0.000	0.005	-0.003	-0.79		1489.80	37.92			0.86	39.20
109			0.00	0.01	0.00	0.330	0.000	0.027	0.001	-0.92		1499.41	36.37			1.04	37.54
110 111			0.00	0.02 -0.01	-0.01 0.01	0.342 0.183	0.000	0.016 0.025	0.008 -0.007	-0.56 0.31		1510.69 1520.21	33.16 31.72			1.42 1.43	34.26 32.81
112				-0.02	0.01	0.172	0.000	0.036		0.28		1531.42	28.57			1.50	29.60
113	203	0.15	0.00	-0.01	0.01	0.161	0.000	0.022	-0.007	0.05	1.19	1540.85	27.21			1.16	28.17
114		-0.23	0.00	0.02	0.00	-0.237	0.000	-0.002	0.003	-0.80	1.08	1551.86	24.27			1.03	25.13
115		0.14		0.00	0.00	0.150	0.000	0.008	0.001	-0.32		1560.96	23.25			0.71	24.07
116 117	206 207	-0.21 -0.20		0.03 0.04		-0.217 -0.207	0.000 0.000	-0.016 -0.029	0.006	-1.20 -1.80		1571.66 1580.65	20.62 19.70			0.53 -0.05	21.35 20.38
				0.04		-0.207 -0.197	0.000	-0.029 -0.020	0.005	-2.08		1591.22	17.20			-0.03 -0.42	17.82
		-0.19 -0.14		0.03		-0.197 -0.146	0.000	-0.020 0.008	0.003	-2.08 -2.24		1600.00	16.50	16.50	0.100	-0.42 -1.12	17.82
		-0.13		0.00		-0.135	0.000	0.007	0.009	-2.67		1610.37	14.19	14.04	0.025	-1.63	14.72
		-0.11		0.00		-0.115	0.000	0.005	0.009	-3.15		1618.80	13.83	13.91	0.075	-2.32	14.32
		-0.09		0.01		-0.094	0.000	-0.008	0.001	-3.37		1628.74	11.96	12.09		-2.74	12.40
		-0.08		0.01		-0.084		-0.009	0.001	-4.06		1636.87	11.91	12.12	0.071	-3.44	12.30
124 125	214	-0.06 0.00		0.02	0.01	-0.063 0.000	0.000 0.000	-0.022 0.000	-0.008 0.000	-4.58 -5.20		1646.39 1654.05	10.47 10.88	10.71 10.93	0.017 0.027	-3.74 -4.29	10.82 11.19
126		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.43		1663.12	9.88	10.30	0.027	-4.48	10.15
127		-0.02		-0.01	0.00	-0.021	0.000	0.012	-0.000	-4.45		1669.03	12.03	12.22		-3.58	12.28
128	218	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.47	-2.64	1676.67	12.47	12.37	0.013	-2.64	12.68
129			0.09		0.00	0.078		0.041	0.009	-4.93		1682.71	14.50	14.47	0.051	-2.12	14.72
130				-0.04	0.00		-0.139	0.055	0.012	-5.12		1690.50	14.78	14.67	0.022	-1.61	15.01
131 132				-0.05 -0.05	0.00 0.00		-0.125 -0.140	0.068 0.069	0.014 0.015	-5.09 -5.11		1696.66 1704.25	16.69 17.17	16.94 17.20	0.009 0.012	-1.54 -1.11	16.90 17.39
133				-0.05	0.00		-0.140	0.003	0.013	-5.69		1710.23	19.26	19.39	0.009	-1.11	19.47
134				-0.06	0.00		-0.140 -0.153	0.083	0.019	-5.69		1710.23	19.20	20.00	0.009	-0.77	20.20
135				-0.06	0.01	0.143	-0.139	0.084	0.009	-5.31	-0.93	1723.29	22.34	22.31	0.005	-0.81	22.54
136				-0.06	0.01		-0.139	0.085	0.010	-4.98		1730.30	23.41	23.20	0.005	-0.38	23.62
137				-0.06	0.02		-0.138	0.087	0.000	-5.01		1735.70	26.08	25.81	0.003	-0.38	26.28
138 139				-0.07 -0.08	0.01	0.174 0.184	-0.111 0.000	0.100 0.113	0.011			1742.56 1747.86	27.29 30.06	26.77 29.59	0.002	-0.07 -0.22	27.51 30.28
140				-0.08	0.00	0.184	0.000	0.113				1754.63	31.36	30.86	0.003	-0.22 -0.09	31.60
141				-0.08	0.01	0.195	0.000	0.115				1759.79	34.27	33.82		-0.38	34.50
142	232	0.19	0.00	-0.07	0.01	0.205	0.000	0.103	0.010	-3.84	-0.50	1766.38	35.75	35.45	0.002	-0.36	35.98
143				-0.07	0.02	0.215	0.000	0.106				1771.26	38.95	38.73		-0.59	39.19
144				-0.06	0.02	0.226	0.000		-0.001			1777.43	40.85	40.61	0.004	-0.41	41.09
145 146				-0.06 -0.05	0.03	0.226 0.237	0.000 0.000		-0.012 -0.014			1782.14 1788.06	44.21 46.36	44.26	0.050	-0.69 -0.50	44.50 46.67
147				-0.05	0.03	0.237	0.000		-0.014			1792.55	49.94			-0.83	50.26
148	238	0.22	0.00	-0.04	0.03	0.237	0.000	0.073	-0.017	-3.31	-0.75	1798.22	52.34			-0.63	52.69
149				-0.04	0.03	0.237	0.000		-0.017				56.20			-0.91	56.58
150				-0.03	0.03	0.237	0.000		-0.020				58.81			-0.73	59.23
151 152				-0.02 -0.01	0.03	0.249	0.000 0.000		-0.022 -0.025				62.91			-1.01 -0.72	63.35
					0.03	0.250						1817.00	65.85				66.35
153 154				-0.01 -0.01	0.03	0.238 0.238	0.000 0.000		-0.025 -0.025			1820.41 1825.11	70.51 73.88			-0.63 -0.15	71.05 74.48
155			0.00	0.00	0.03	0.239	0.000		-0.023 -0.018			1828.19	78.88			-0.13 -0.01	79.47
156	246		0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-1.33	0.40	1832.70	82.43			0.45	83.10
157	247	0.21	0.00	0.01	0.01	0.228	0.000	0.008	-0.011	-1.27	0.33	1835.84	87.37			0.34	88.05
158			0.00	0.01	0.01	0.217	0.000		-0.011			1840.38	90.89			0.55	91.65
159 160			0.00 0.00	0.02 0.03	0.01	0.218 0.218			-0.013 -0.006			1843.40 1847.74	95.94 99.67			0.39 0.58	96.77 100.58
161			0.00	0.03	0.00	0.218			-0.008			1847.74					100.58
162			0.00	0.04	0.00	0.207			-0.008			1855.12					109.53

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 90 ((Th)															
163	253	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	-1.45	0.10	1857.67	113.96			0.14	115.14
164	254	0.17	0.00	0.04	0.00	0.185	0.000	-0.036	-0.007	-1.06		1861.54					119.44
165			0.00	0.04	0.00	0.174		-0.037		-1.19		1864.07					125.07
166		0.13		0.01	0.01	0.140		-0.004		-0.36		1867.54					129.75
167		0.12		0.01	0.01	0.129	0.000			-0.77		1870.05					135.41
168		0.12		0.01	0.01	0.129	0.000			-0.93		1874.04					139.60
	259			0.01		-0.176	0.000	-0.000	0.001	-1.89		1876.59					145.20
		-0.17 -0.17				-0.176 -0.176	0.000 0.000	0.012 0.012	0.009	-2.21 -2.85		1880.34 1882.63					149.65 155.56
						-0.176 -0.135	0.000	0.012	0.009			1886.01				-1.53	160.39
										-2.98							166.51
						-0.125 -0.125	0.000 0.000	0.018 0.018	0.008	-2.98 -2.95		1888.08 1891.28				-2.07 -2.08	171.52
		-0.12				-0.104	0.000	0.014	0.009			1893.29					177.71
		-0.10				-0.105	0.000	-0.007	0.011			1896.44				-2.87	182.77
177	267	-0.10	0.00	0.02	0.00	-0.105	0.000	-0.019	0.002			1898.17				-3.40	189.25
178	268	-0.09	0.00	0.02	-0.01	-0.094	0.000	-0.020	0.012	-4.03	-3.41	1900.99	191.71			-3.37	194.67
		-0.08		0.02		-0.084	0.000		0.002			1902.30				-3.66	201.56
180	270	-0.05	0.00	0.01	0.00	-0.053	0.000	-0.011	0.001	-4.01	-3.39	1904.67	204.18			-3.39	207.41
181		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000			1905.94					214.36
182	272	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.63	-3.86	1908.50	216.48			-3.86	220.04
183	273	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.14	-4.34	1909.70	223.36			-4.34	227.08
184		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000			1911.83				-4.14	
	275	-0.01		0.00	0.00		0.000	0.000	0.000			1911.50				-3.24	
186		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-3.30		1913.00				-2.57	248.53
187				-0.01	0.00		-0.095	0.014	0.004			1912.68				-1.76	
188				-0.02	0.00		-0.123	0.028	0.007			1914.18				-1.18	264.02
189				-0.03	0.00		-0.138	0.041	0.010	-4.10		1914.73				-1.42	271.78
190 191				-0.03 -0.02	0.01 0.02		-0.151 -0.163	0.042 0.031	0.001 -0.009			1916.31 1916.58				-1.11 -1.23	278.51 286.55
192				-0.02	0.02		-0.103 -0.177		-0.009			1917.87				-0.76	293.58
193				-0.02	0.02		-0.177		-0.007	-4.23		1917.71				-0.65	302.01
194			0.00	0.02		0.419	0.000	-0.049		-3.59		1918.59				-0.22	309.17
195			0.00		-0.01	0.419						1918.62					317.41
196	286		0.00		-0.02	0.420						1919.87				-0.19	324.54
197	287	0.37	0.00	0.10	-0.02	0.420	0.000	-0.063	-0.018	-3.90	-0.41	1919.67	326.39			-0.33	333.01
198	288	0.37	0.00	0.10	-0.02	0.420	0.000	-0.063	-0.018	-3.59	-0.16	1920.69	333.43			-0.06	340.31
199	289	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.46	-0.26	1920.35	341.85			-0.01	349.11
200			0.00		-0.03	0.434			-0.018			1921.07					356.72
201			0.00		-0.03	0.434						1920.97					365.12
202	292			-0.08	0.01	0.184	0.000	0.113	0.010	-3.09	-0.55	1922.20	364.21			-0.13	372.39
203				-0.08	0.01	0.184	0.000	0.113				1921.73					381.18
204				-0.07	0.02	0.193	0.000					1922.49					388.69
205				-0.07	0.02	0.193	0.000					1922.08					397.43
206207				-0.07	0.02 0.03	0.193 0.204	0.000 0.000					1922.79					405.07
				-0.06								1922.11					414.11
208209				-0.06 -0.05	0.03 0.03	0.204 0.204	0.000 0.000					1922.69 1921.90					421.89 430.96
Z :	= 91 ((Pa)															
	200		0.00	0.02	0.00	0.330	0.000	0.015	-0.002	-1.16	0.76	1497.32	45.75			0.62	47.10
110	201	0.30	0.00	0.02	-0.01	0.330	0.000	0.014	0.007	-0.79		1508.72	42.42			0.94	43.71
111				-0.01	0.01	0.194	0.000		-0.007	0.04		1518.46	40.75			1.17	42.03
112				-0.02	0.01	0.183	0.000		-0.005	0.13		1529.59	37.70			1.38	38.91
113	204	0.16	0.00	-0.02	0.01	0.172	0.000	0.036	-0.005	-0.11	1.18	1539.35	36.01			1.15	37.14
114		0.15	0.00	-0.01	0.00	0.161	0.000	0.022		-0.04		1550.39	33.03			1.07	34.10
115	206		0.00	0.00	0.00	0.162	0.000	0.009		-0.35		1559.88	31.62			0.75	32.61
		0.14	0.02	0.01	0.00	0.151	0.027	0.004	0.001	0.46	0.65	1570.60	28.97			0.63	29.90
116		0.14 -0.21		0.01		-0.131 -0.217		-0.004 -0.039		-0.46 -1.78		1579.83	27.81			0.03	28.64

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	EFL mic (MeV)	M _{th} FL (MeV)
7	= 91 ((P a)															
		-0.20	0.00	0.04	0.00	-0.207	0.000	-0.029	0.008	-1.96	-0.20	1590.52	25.19			-0.24	25.97
119		-0.15		0.00		-0.156	0.000	0.009	0.009	-1.92		1599.51	24.27			-0.73	25.00
120 121		-0.14 -0.12		0.00 0.00		-0.146 -0.125	0.000 0.000	0.009 0.007	0.019 0.019	-2.41 -2.77		1609.91 1618.63	21.95 21.30	21.61	0.075	-1.21 -1.76	22.64 21.94
		-0.12 -0.10		0.00		-0.125 -0.105	0.000	-0.007	0.019			1628.59	19.41	19.66	0.073	-1.76 -2.16	19.99
		-0.09		0.01		-0.094	0.000	-0.008	0.001	-3.44		1637.09	18.98	19.49	0.076	-2.83	19.51
		-0.06		0.02		-0.063	0.000	-0.022	-0.008	-3.82	-3.03	1646.54	17.60	17.87	0.087	-3.02	18.09
	216	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-4.39		1654.59	17.62	17.80	0.070	-3.55	18.07
	217 218	0.00 -0.02		0.00 -0.01	0.00 0.00	0.000 -0.021	0.000 0.000	0.000 0.012	0.000 -0.000	-4.62 -3.65		1663.70 1670.03	16.58 18.33	17.07 18.67	0.052 0.025	-3.73 -2.84	16.99 18.69
128				-0.02	0.00		-0.096	0.027	0.005	-3.85		1677.79	18.64	18.52		-1.97	18.99
	220			-0.04	0.00		-0.125	0.054	0.011	-4.86		1684.56	19.94	20.38	0.057	-1.79	20.28
130				-0.04	0.00		-0.139	0.056	0.013	-4.89		1692.45	20.12	20.38	0.052	-1.35	20.45
131 132				-0.05 -0.05	0.00		-0.125 -0.140	0.068 0.069	0.014 0.016	-4.86 -4.98		1699.07 1706.74	21.57 21.97	22.32	0.071	-1.34 -0.97	21.87 22.27
132				-0.05	0.00		-0.140 -0.139	0.003	0.010	-4.96 -5.45		1713.20	23.58	23.87	0.071	-0.97 -1.07	23.87
134				-0.06	0.01		-0.159 -0.153	0.083	0.010	-5.45		1720.66	24.20	24.34	0.071	-0.76	24.49
135	226	0.14	0.11	-0.06	0.02		-0.152	0.086	0.001	-5.72	-0.92	1726.77	26.15	26.03	0.011	-0.81	26.43
136				-0.06	0.02		-0.138	0.085	-0.001	-4.95		1733.87	27.12	26.83	0.007	-0.45	27.40
137				-0.06	0.02		-0.138	0.087	0.000	-5.11		1739.77	29.30	28.92	0.004	-0.55	29.55
138 139	230			-0.09 -0.09	0.00 0.00	0.185 0.185	0.000 0.000	0.126 0.126	0.024 0.024	-4.90 -5.18		1746.76 1752.55	30.38 32.66	29.90 32.17	0.003 0.003	-0.31 -0.57	30.68 32.95
140				-0.08	0.01	0.195	0.000	0.115		-4.43		1759.34	33.94	33.43	0.002	-0.47	34.21
	232			-0.08	0.01	0.206	0.000	0.116		-4.86		1764.91	36.44	35.95	0.008	-0.76	36.71
142				-0.08	0.02	0.205	0.000	0.116	0.002	-4.72		1771.57	37.86	37.49	0.002	-0.75	38.15
	234			-0.07	0.02	0.215	0.000	0.106	0.001	-4.58		1776.82	40.68	40.34	0.005	-1.00	40.94
144	235 236			-0.07 -0.06	0.03	0.226 0.226	0.000 0.000	0.108 0.095	-0.009 -0.012	-4.60 -4.43		1783.12 1788.13	42.45 45.51	42.33 45.35	0.050 0.200	-0.87 -1.12	42.77 45.81
	237			-0.05	0.03	0.237	0.000		-0.014			1794.14	47.57	47.64	0.100	-1.00	47.89
147	238	0.22	0.00	-0.05	0.03	0.237	0.000	0.085	-0.014	-4.27	-1.37	1798.95	50.83	50.77	0.060	-1.26	51.17
	239			-0.04	0.03	0.237	0.000		-0.017			1804.64	53.21			-1.05	53.57
149 150				-0.04 -0.03	0.03	0.237 0.237	0.000 0.000		-0.017 -0.020	-4.01 -3.56		1809.22 1814.69	56.71 59.30			-1.33 -1.13	57.09 59.72
151				-0.02	0.03	0.249	0.000		-0.020			1819.02	63.05			-1.39	63.48
152	243	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-3.28	-1.17	1824.16	65.98			-1.09	66.46
153				-0.01	0.03	0.238	0.000		-0.025			1827.92	70.29			-0.99	70.81
154	245 246		0.00	-0.01	0.03	0.238 0.239	0.000 0.000		-0.025 -0.018			1832.70 1836.05	73.57 78.30			-0.56 -0.33	74.16 78.87
156			0.00	0.00	0.02	0.239	0.000		-0.018 -0.018			1840.59	81.83			0.13	82.46
157			0.00	0.01	0.01	0.228	0.000		-0.011		0.08	1844.04	86.46			0.07	87.11
	249	0.20	0.00	0.01	0.01	0.217	0.000		-0.011			1848.56	90.00			0.32	90.72
	250		0.00	0.02	0.00	0.217		-0.007				1851.93	94.71			0.16	95.47
160	251 252		0.00 0.00	0.03 0.04	0.00	0.218 0.219		-0.019 -0.031				1856.29 1859.70	98.42			0.38 -0.00	99.28 104.03
162			0.00	0.04	0.00	0.219		-0.031				1863.95					107.93
	254	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	-1.55	0.02	1866.82	112.10			0.04	113.21
	255		0.00	0.04	0.00	0.185		-0.036				1870.67					117.53
	256		0.00	0.03	0.00	0.174		-0.025				1873.50					122.83
	257258		0.00 0.00	0.03 0.01	0.00	0.174 0.140		-0.025 -0.004				1877.15 1879.75					127.36 132.92
	259	0.12		0.00	0.01	0.129	0.000		-0.010			1883.67					137.17
	260			0.01		-0.176	0.000	-0.000	0.001			1886.50				-0.53	142.49
170	261	-0.17				-0.176	0.000	0.001		-1.97		1890.31				-0.76	
171 172		-0.17				-0.176 -0.135	0.000 0.000	0.001		-2.63 -2.35		1892.94 1896.28				-1.33	
								0.019								-1.29	
		-0.13 -0.12				-0.135 -0.125	0.000 0.000	0.007 0.018		-2.69 -2.64		1898.62 1901.85				-1.75 -1.78	
							,,,,,,,	,			50		50				

N	A	ε_2	ε_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 91 ((Pa)															
		-0.10	0.00	0.00	-0.01	-0.104	0.000	0.004	0.009	-2.99	-2.42	1904.18	171.59			-2.41	173.97
		-0.10		0.01		-0.105		-0.008	0.001			1907.27					179.07
		-0.10 -0.09		0.02		-0.105 -0.094		-0.019 -0.020	0.002 0.012			1909.39 1912.20					185.17 190.60
		-0.09 -0.08		0.02		-0.094		-0.020 -0.021	0.002			1913.76					197.24
180	271	-0.04	0.00	0.01	0.00	-0.042	0.000	-0.011	0.001	-3.52	-2.88	1916.08	200.06			-2.88	203.13
		-0.03		0.01		-0.032	0.000	-0.011	0.000			1917.76				-3.37	209.66
	273 274		0.00	0.00	0.00	0.011	0.000 0.000	0.000 0.000	0.000 0.000			1920.22 1921.73					215.43 222.15
	275		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1923.85				-3.58	228.27
185	276	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-3.41	-2.70	1923.85	232.64			-2.70	236.51
	277		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1925.35				-2.02	243.25
	278 279		0.08	-0.01 -0.02	0.00		-0.109 -0.123	0.015 0.028	0.005 0.007	-3.22		1925.54 1927.10				-1.38 -0.88	251.42 258.15
	280			-0.02	0.00		-0.138	0.041	0.010			1928.02				-1.18	265.54
190	281	0.06	0.11	-0.03	0.01	0.069	-0.151	0.042	0.001	-3.86	-1.11	1929.63	267.22			-0.89	272.23
	282			-0.02	0.02		-0.163	0.031				1930.21				-1.00	279.95
	283 284		0.13	-0.02 0.09	0.02 -0.01	0.070 0.419		0.032 -0.049		-4.17 -4.00		1931.51 1931.56				-0.56 -0.61	286.95 294.90
	285		0.00		-0.01	0.419			-0.022 -0.022			1931.30				-0.01 -0.46	301.76
195	286	0.37	0.00	0.09	-0.01	0.419	0.000	-0.049	-0.022	-3.99	-0.68	1933.33	303.88			-0.68	309.69
	287		0.00		-0.02	0.420		-0.063				1934.58				-0.43	316.80
	288 289		0.00		-0.02 -0.02	0.420 0.420		-0.063 -0.063		-4.10 -3.78		1934.68 1935.59				-0.55 -0.16	324.98 332.38
	290		0.00		-0.02 -0.03	0.420		-0.003 -0.085				1935.63				-0.10 -0.22	340.77
200	291	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.42	-0.35	1936.70	340.86			-0.12	348.04
	292		0.00	0.02	0.02	0.308	0.000		-0.023			1936.43				-0.36	356.38
	293 294		0.00	0.02 -0.08	0.02 0.01	0.308 0.184	0.000 0.000	0.013	-0.023 0.010	-1.98 -3.68		1937.30 1937.62				-0.23 -0.56	363.83 372.22
	295			-0.03 -0.07	0.01	0.193	-0.014			-3.08 -3.28		1937.02					372.22
	296	0.18	0.01	-0.07	0.02	0.193	-0.014		-0.002			1938.31				-0.98	388.12
	297			-0.07	0.02	0.193	0.000		-0.002	-3.61		1939.03				-0.95	395.75
	298 299			-0.06 -0.06	0.03 0.03		-0.014 0.000		-0.014 -0.014								404.46 412.23
	300			-0.05	0.03	0.204	0.000		-0.014 -0.016								421.00
210	301	0.20	0.00	-0.05	0.04	0.215	0.000	0.082	-0.026	-3.85	-2.01	1939.38	418.89			-1.55	428.89
211	302	0.20	0.00	-0.04	0.04	0.215	0.000	0.069	-0.028	-3.82	-2.12	1938.59	427.76			-1.71	438.00
\boldsymbol{z}	= 92 ((U)															
	203			-0.01	0.01	0.205	0.000		-0.006			1517.95	48.55			1.01	50.04
	204			-0.02	0.01	0.183 0.183	0.000		-0.005 -0.007	0.20		1529.38 1539.11	45.19			1.35	46.61
	205 206			-0.01 -0.01	0.01	0.183	0.000 0.000		-0.007 -0.007	0.05 0.06		1550.48	43.54 40.24			1.20 1.22	44.87 41.51
	207		0.00	0.00	0.00	0.162	0.000	0.009	0.001	-0.16		1560.00	38.78			0.92	39.97
	208		0.00		-0.01	0.162		-0.003		-0.23		1571.09	35.76			0.85	36.88
	209		0.02		-0.01	0.151		-0.016		-0.59		1580.29	34.64			0.53	35.69
		-0.20 -0.15		0.05		-0.207 -0.156		-0.040 -0.002	0.010	-1.71 -1.52		1591.36 1600.46	31.65 30.61			0.11 -0.44	32.61 31.52
		-0.14				-0.146		-0.003				1611.16	27.99			-0.81	28.84
		-0.12				-0.125		-0.005				1619.91	27.31			-1.35	28.11
		-0.11		0.01		-0.115		-0.007	0.001			1630.22	25.06			-1.68	25.81
		-0.09 -0.07		0.02		-0.094 -0.073		-0.020 -0.021				1638.78 1648.69	24.58 22.74			-2.36 -2.60	25.27 23.39
	217		0.00	0.00	0.00	0.000	0.000	0.000				1656.66	22.84	22.70	0.087		23.43
	218		0.00	0.00	0.00	0.000	0.000	0.000				1666.17	21.40	21.92		-3.18	21.95
	219			-0.01	0.00		-0.054	0.013				1672.54	23.10	23.21	0.057		23.61
	220 221			-0.02 -0.03	0.00		-0.110 -0.124	0.027 0.042				1680.79 1687.55	22.93 24.24			-1.49 -1.28	23.42 24.70
	1	0.00	0.07	0.03	0.00	0.007	J.124	J.U72	0.007	1.02	1.01	1001.55				1.20	21.70

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 92 ((U)															
130	222			-0.04	0.01	0.100	-0.138	0.056	0.002	-4.18	-0.87	1695.82	24.03			-0.81	24.49
	223			-0.04	0.01		-0.138	0.056	0.003	-4.25		1702.49	25.44	25.84	0.071	-0.81	25.85
	224 225			-0.05 -0.06	0.01		-0.139 -0.139	0.070 0.084	0.006	-4.33 -4.93		1710.56 1717.06	25.43 27.01	25.71 27.38	0.025 0.012	-0.43 -0.54	25.86 27.41
	226			-0.06	0.01		-0.139 -0.139	0.084	0.009	-4.67		1724.94	27.01	27.33	0.012	-0.34 -0.27	27.60
135	227	0.14	0.10	-0.06	0.02	0.153	-0.138	0.085	-0.001	-4.81	-0.48	1731.15	29.06	29.02	0.017	-0.37	29.44
	228			-0.09	-0.01	0.186	0.000	0.126	0.035	-4.90		1738.76	29.52	29.23	0.015	-0.06	29.96
	229			-0.09	0.00	0.185	0.000	0.126	0.024	-5.00		1744.90	31.46	31.21	0.006	-0.39	31.85
138 139	230			-0.09 -0.08	0.00	0.185 0.195	0.000 0.000	0.126 0.114	0.024 0.022	-4.95 -4.77		1752.42 1758.28	32.00 34.22	31.61 33.81	0.005 0.003	-0.33 -0.64	32.40 34.58
140				-0.08						-4.77 -4.74							
	232			-0.08 -0.08	0.01	0.206 0.206	0.000 0.000	0.116 0.116	0.013	-4.74 -5.09		1765.57 1771.21	35.00 37.43	34.61 36.92	0.002 0.003	-0.63 -0.96	35.35 37.78
	234			-0.07	0.02	0.215	0.000	0.106	0.001	-4.58		1778.27	38.45	38.15	0.002	-1.00	38.79
143	235	0.20	0.00	-0.07	0.02	0.215	0.000	0.106	0.001	-4.84	-1.37	1783.57	41.21	40.92	0.002	-1.25	41.55
	236			-0.07	0.03	0.226	0.000	0.108	-0.009			1790.23	42.63	42.45	0.002	-1.08	43.02
	237			-0.06	0.03	0.226	0.000		-0.012			1795.25	45.67	45.39		-1.33	46.04
	238 239			-0.06 -0.05	0.04	0.236 0.237	0.000 0.000		-0.021 -0.024			1801.64 1806.54	47.36 50.53	47.31 50.57	0.002 0.002	-1.13 -1.48	47.80 50.96
	240			-0.05	0.04	0.237	0.000		-0.024			1812.62	52.52	52.72	0.002	-1.46	52.99
149				-0.04	0.04	0.237	0.000					1817.23	55.99			-1.55	56.46
150	242	0.22	0.00	-0.03	0.03	0.237	0.000	0.060	-0.020	-3.77	-1.45	1823.01	58.27			-1.35	58.72
	243			-0.02	0.03	0.249	0.000	0.050	-0.022		-1.70	1827.38	61.98			-1.62	62.44
	244			-0.01	0.03	0.250	0.000		-0.025			1832.90	64.53			-1.34	65.03
	245 246			-0.01 -0.01	0.03	0.238 0.238	0.000 0.000		-0.025 -0.025	-3.30 -2.79		1836.68 1841.82	68.82 71.75			-1.23 -0.79	69.36 72.35
155 156			0.00	0.00	0.02 0.02	0.239 0.239	0.000		-0.018 -0.018	-2.36 -1.89		1845.26 1850.14	76.39 79.58			-0.62 -0.14	76.96 80.21
	249		0.00	0.00	0.02	0.239	0.000		-0.010	-1.75		1853.55	84.23			-0.15	84.88
158	250		0.00	0.01	0.01	0.228	0.000		-0.011	-1.40		1858.39	87.46			0.14	88.17
159	251	0.20	0.00	0.02	0.01	0.218	0.000	-0.006	-0.013	-1.52	0.00	1861.77	92.15			0.01	92.93
	252		0.00	0.03	0.00	0.218		-0.019		-1.40		1866.65	95.34			0.04	96.18
	253 254		0.00	0.04	0.00	0.219 0.219		-0.031		-1.85		1869.94 1874.51				-0.20 -0.06	101.05 104.62
	254 255		0.00 0.00	0.04	0.00	0.219		-0.031				1877.44					104.62
	256		0.00	0.04	0.00	0.196			-0.007			1881.50					113.94
165	257	0.16	0.00	0.03	0.00	0.174	0.000	-0.025	-0.005	-1.05	0.13	1884.27	118.08			0.14	119.30
	258	0.16	0.00	0.03	0.00	0.174			-0.005			1888.28				0.43	123.46
	259		0.00	0.02	0.00	0.173			-0.003			1890.92					128.95
	260		0.00	0.01	0.01	0.129			-0.011			1895.01					133.05
	261		0.00	0.00	0.01	0.129	0.000					1897.76					138.46
		-0.17 -0.17				-0.176 -0.176	0.000 0.000	0.001				1901.86 1904.49					142.54 148.08
		-0.17				-0.176	0.000	0.001				1908.23					152.52
						-0.125	0.000	0.018				1910.58					158.36
174	266	-0.12	0.00	-0.01	-0.01	-0.125	0.000	0.018	0.008	-2.29	-1.46	1914.08	160.91			-1.45	163.05
175	267	-0.10	0.00	0.00	-0.01	-0.104	0.000	0.004	0.009	-2.61	-2.04	1916.38	166.68			-2.03	168.94
		-0.10		0.01		-0.105		-0.008	0.001			1919.85					173.66
		-0.10 -0.09		0.02		-0.105 -0.094		-0.019 -0.020				1921.92 1925.04					179.80 184.92
		-0.09 -0.08		0.02		-0.094 -0.084		-0.020 -0.021				1925.04					184.92
		-0.04		0.01		-0.042		-0.011				1929.23					197.12
	273		0.00	0.00	0.00	0.000	0.000	0.000				1929.23					203.71
	274		0.00	0.00	0.00	0.000	0.000	0.000				1933.70					209.08
	275		0.00	0.00	0.00	0.000	0.000	0.000				1935.19					215.81
	276		0.00	0.00	0.00	0.000	0.000	0.000				1937.62					221.61
		-0.01		0.00		-0.011	0.000	0.000				1937.59					229.88
186	278	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-2.19	-1.51	1939.44	252.41			-1.51	236.27

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 92 ((U)															
	279	` '	0.08	-0.01	0.00	0.035	-0.109	0.015	0.005	-2.77	-1.04	1939.71	240.21			-0.95	244.34
	280			-0.02	0.00		-0.123	0.028	0.007	-2.71		1941.74				-0.60	250.60
189 190	281			-0.03 -0.02	0.01		-0.137 -0.150	0.041 0.030	-0.000 0.000	-3.34 -3.25		1942.53 1944.43				-0.75 -0.46	258.11 264.48
	283			-0.02	0.02		-0.163		-0.009	-3.79		1945.02				-0.56	272.20
	284	0.38	0.00	0.09	0.00	0.431	0.000	-0.043	-0.032		-0.26	1946.49	273.79			-0.15	278.85
	285		0.00	0.09	0.00	0.419		-0.047		-3.88		1947.03				-0.41	286.57
194 195	286 287		0.00	0.09	-0.01 -0.01	0.419 0.420		-0.049 -0.060		-3.51 -4.09		1948.67 1949.09				-0.22 -0.44	293.16 301.07
	288		0.00		-0.01	0.420		-0.060		-3.80		1950.60				-0.20	307.86
197	289	0.37	0.00	0.10	-0.02	0.420	0.000	-0.063	-0.018	-3.80	-0.24	1950.51	310.12			-0.16	316.19
	290		0.00			0.421				-3.95		1952.02				0.03	323.08
199	291	0.37	0.00	0.11 0.01	-0.02 0.02	0.421 0.296	0.000 0.000		-0.022 -0.019	-4.17 -1.79		1952.12 1953.25				-0.24 -0.09	331.24 338.25
	293		0.00	0.01	0.02	0.296	0.000		-0.019	-2.09		1953.29				-0.41	346.50
202	294	0.27	0.00	0.01	0.02	0.296	0.000	0.022	-0.019	-1.92	-0.31	1954.50	346.49			-0.31	353.61
	295			-0.07	0.02	0.205	0.000		-0.001	-3.36		1954.65				-0.54	362.09
204 205	296			-0.07 -0.07	0.02	0.205 0.193	0.000		-0.001			1955.87				-0.59 -0.94	369.20
	297			-0.07 -0.07	0.02 0.03	0.193	0.000 0.000		-0.002 -0.011			1955.69 1956.80				-0.94 -0.92	377.70 385.01
	299			-0.06	0.03	0.204	0.000		-0.014			1956.47				-1.34	393.59
208				-0.06	0.03	0.204	0.000		-0.014			1957.27				-1.22	401.14
209				-0.05	0.04	0.215	0.000		-0.026			1957.05				-1.70	409.78
210	302			-0.05 -0.04	0.04 0.04	0.215 0.215	0.000 0.000		-0.026 -0.028			1957.72 1956.94				-1.59 -1.76	417.47 426.55
	304			-0.04	0.04	0.215	0.000		-0.028			1957.37				-1.53	434.49
	305			-0.03	0.04	0.215	0.000					1956.46				-1.68	443.73
\boldsymbol{z}	= 93 ((Np)															
	206	_	0.00	-0.01	0.01	0.183	0.000	0.025	-0.007	-0.07	1.10	1536.87	53.06			1.06	54.60
114				-0.01	0.01	0.183	0.000	0.025	-0.007	-0.04		1548.26	49.74			1.11	51.21
115 116			0.00	0.00	0.00	0.172 0.162	0.000 0.000	0.011	0.001 0.001	-0.24 -0.20		1558.16 1569.26	47.92 44.89			0.86 0.83	49.30 46.20
	210		0.00	0.01	-0.01	0.162	0.000		0.009	-0.50		1578.83	43.39			0.56	44.63
118	211	0.14	0.00	0.02	-0.01	0.151	0.000	-0.016	0.007	-0.66	0.30	1589.84	40.45			0.27	41.62
		-0.17				-0.177		-0.011	0.012			1599.27	39.09			-0.22	40.18
		-0.15 -0.13				-0.156 -0.135		-0.002 -0.004	0.020 0.011			1609.92 1619.02	36.51 35.48			-0.49 -0.97	37.55 36.45
		-0.13		0.01		-0.115		-0.007	0.001			1629.38	33.19			-1.30	34.11
123	216	-0.09	0.00	0.02	0.00	-0.094	0.000	-0.020	0.002	-2.54	-1.90	1638.30	32.35			-1.91	33.21
124	217	-0.07	0.00	0.02	0.01	-0.073		-0.021	-0.008	-2.78	-2.06	1648.16	30.56			-2.06	31.37
	218 219	0.00 0.00		0.00	0.00		-0.013 -0.013	0.000 0.000	0.000 0.000			1656.43 1665.98	30.35 28.88			-2.36 -2.53	31.11 29.59
	220			-0.00	0.00		-0.013 -0.082	0.000	0.003			1672.95	29.99			-2.33 -1.83	30.65
128				-0.02	0.00		-0.110	0.027	0.006			1681.35	29.65			-1.16	30.28
129	222			-0.03	0.00		-0.124	0.042	0.009	-3.68	-1.02	1688.56	30.51			-1.00	31.11
	223			-0.03	0.01		-0.138	0.043	0.001			1696.91	30.24			-0.57	30.81
131	224 225			-0.03 -0.05	0.01		-0.152 -0.139	0.045 0.070	0.003			1703.94 1712.05	31.27 31.24	31.59	0.072	-0.54 -0.16	31.81 31.77
	226			-0.06	0.01		-0.125	0.070	0.007			1718.99	32.37	21.37	0.072	-0.32	32.86
	227			-0.06	0.02		-0.123	0.085	-0.001			1726.97	32.46	32.56	0.073	-0.10	32.96
	228			-0.06	0.02		-0.138	0.087	0.000			1733.63	33.88	22.55	0.05=	-0.26	34.34
136 137	229 230			-0.09 -0.09	0.00	0.185 0.185	0.000	0.126 0.126	0.024 0.024			1741.58 1748.14	33.99 35.50	33.78 35.24	0.087 0.051	-0.29 -0.63	34.48 35.97
137				-0.09 -0.09	0.00	0.183	0.000	0.120	0.024			1746.14	35.96	35.62	0.051	-0.62	36.43
	232			-0.09 -0.08	0.00	0.190	0.000	0.127				1762.06	37.73	JJ.U2	0.031	-0.02 -1.01	38.14
140	233	0.19	0.00	-0.08	0.01	0.206	0.000	0.116	0.013	-5.14	-1.16	1769.44	38.42	37.95		-1.04	38.84
141	234	0.20	0.00	-0.08	0.02	0.216	0.000	0.119	0.004	-5.56	-1.57	1775.56	40.38	39.96	0.009	-1.46	40.78

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 93 ((Np)															
	235	_	0.00	-0.08	0.02	0.216	0.000	0.119	0.004	-5.56	-1.59	1782.64	41.36	41.04	0.002	-1.46	41.79
143	236	0.21	0.00	-0.07	0.03	0.226	0.000	0.108	-0.009	-5.44	-1.81	1788.30	43.77	43.38	0.050	-1.70	44.18
	237			-0.07	0.03	0.226	0.000		-0.009			1795.01	45.14	44.87	0.002	-1.58	45.57
	238			-0.06	0.03	0.226	0.000		-0.012			1800.41	47.80	47.46	0.002	-1.82	48.21
	239			-0.06	0.04	0.236	0.000		-0.021	-5.20		1806.84	49.45	49.31		-1.63	49.92
	240			-0.05 -0.05	0.04	0.237	0.000		-0.024			1812.09	52.27	52.31		-1.96	52.73
148 149				-0.03 -0.04	0.04 0.04	0.237 0.237	0.000 0.000		-0.024 -0.027	-4.89 -4.89		1818.20 1823.17	54.23 57.33	54.26 57.42	0.071 0.200	-1.74 -2.02	54.73 57.83
150				-0.03	0.03	0.237	0.000		-0.020			1828.99	59.58	37.12	0.200	-1.83	60.06
151	244	0.23	0.00	-0.02	0.04	0.249	0.000	0.051	-0.032	-4.64	-2.21	1833.77	62.88			-2.08	63.42
152	245	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-3.98	-1.87	1839.26	65.45			-1.80	65.97
153	246	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-3.84		1843.41	69.38			-1.70	69.93
	247			-0.01	0.03	0.238	0.000			-3.23		1848.54	72.31			-1.23	72.91
155			0.00	0.00	0.02	0.239	0.000		-0.018			1852.35	76.58			-1.06	77.16
156		0.22		0.00	0.02	0.239	0.000		-0.018			1857.26	79.74			-0.59	80.38
157	250	0.22	0.00	0.01	0.02	0.240 0.228	0.000 0.000		-0.021 -0.011	-2.24 -1.72		1860.98 1865.78	84.10 87.36			-0.50 -0.18	84.77 88.07
159		0.21		0.01	0.01	0.228	0.000		-0.011 -0.013	-1.72 -1.89		1869.45	91.76			-0.18 -0.25	92.52
	253	0.21		0.03	0.00	0.229		-0.018		-1.76		1874.28	95.00			-0.15	95.82
161	254	0.21	0.00	0.04	0.00	0.230	0.000	-0.030	-0.009	-2.18	-0.47	1877.99	99.37			-0.46	100.25
162	255	0.20	0.00	0.04	0.00	0.219	0.000	-0.031	-0.008	-1.96	-0.32	1882.57	102.86			-0.30	103.82
163	256	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-1.94	-0.39	1885.82	107.68			-0.37	108.71
	257		0.00	0.04	0.00	0.196			-0.007			1889.86					112.82
	258	0.17		0.03	0.00	0.185		-0.024		-1.26		1892.94					117.87
	259	0.16		0.02	0.00	0.173			-0.003			1897.04					121.92
167	260	0.16 0.13		0.02 0.01	0.00	0.173 0.140		-0.013 -0.004		-0.97 -0.65		1899.94 1903.95					127.17 131.34
	262	0.13		0.00	0.01	0.140	0.000		-0.011 -0.010	-0.03 -1.03		1903.93				-0.22	136.45
170		-0.17		0.00		-0.176	0.000	0.012	0.009	-1.45		1910.98				-0.29	140.63
171		-0.17		0.01	-0.01	-0.176	0.000	0.001	0.010	-2.10	-0.87	1913.97	144.10			-0.87	145.81
172	265	-0.17	0.00	0.01	-0.01	-0.176	0.000	0.001	0.010	-2.16	-0.89	1917.72	148.42			-0.88	150.24
173		-0.13				-0.135	0.000	0.007	0.009	-2.20		1920.34				-1.27	155.80
						-0.125	0.000	0.018	0.008			1923.88					160.45
		-0.11 -0.10				-0.115 -0.105	0.000	0.005 -0.007				1926.44 1929.97					166.07 170.74
		-0.10 -0.10		0.02		-0.105 -0.105		-0.019 -0.019				1932.33 1935.47					176.56 181.65
		-0.10		0.02		-0.103		-0.019 -0.021				1937.29				-2.48	
		-0.07		0.02		-0.073		-0.021				1940.03					193.48
181	274	-0.04	0.00	0.01	0.00	-0.042	0.000	-0.011	0.001	-3.10	-2.46	1941.81	196.98			-2.46	199.90
182	275	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-3.01	-2.32	1944.50	202.35			-2.32	205.42
	276	0.00		0.00	0.00		-0.013	0.000				1946.31					211.83
184		0.00		0.00	0.00		-0.013	0.000				1948.74					217.62
185	278	0.01	0.04	0.00	-0.01 0.00		-0.054 -0.054	0.001 0.001				1949.18 1950.97					225.46 231.88
187	280			-0.01 -0.02	0.00		-0.109 -0.123	0.015 0.028				1951.78 1953.88					239.37 245.54
	282			-0.02	0.00		-0.150	0.030				1955.02					252.70
190			0.00	0.09	0.00	0.431						1956.77					259.10
	284		0.00	0.09	0.00	0.431						1957.72					266.37
192	285	0.37	0.00	0.09	0.00	0.419	0.000	-0.047	-0.032	-3.79	-0.43	1959.65	267.92			-0.33	272.74
	286		0.00	0.09	0.00	0.419						1960.49					280.14
194			0.00		-0.01	0.419						1962.12					286.73
	288		0.00		-0.01	0.420						1962.87					294.31
196			0.00		-0.01	0.420						1964.22					301.26
	290	0.37			-0.01	0.420						1964.69					309.04
198	291	0.36	0.00	0.10	-0.01	0.408	0.000	-0.064	-0.026	-3.94	-0.47	1966.26	309.74			-0.33	315.80

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 93 ((Np)															
199		0.27	0.00	0.00	0.02	0.295	0.000	0.034	-0.016	-2.27	-0.50	1966.46	317.61			-0.53	323.73
200		0.27		0.01	0.02	0.296	0.000		-0.019	-2.17		1967.89				-0.49	330.62
201 202		0.27 0.27		0.01	0.02	0.296 0.296	0.000 0.000		-0.019 -0.019	-2.44 -2.31		1968.19 1969.44				-0.77 -0.72	338.60 345.65
202				-0.01	0.02	0.290	0.000		-0.019 -0.001	-2.31 -3.70		1969.44				-0.72 -0.85	353.92
204				-0.07	0.02	0.205	0.000		-0.001			1971.02				-0.92	361.00
205				-0.06	0.02	0.215	0.000		-0.013	-3.79		1971.12				-1.25	369.21
206	299	0.19	0.00	-0.06	0.03	0.204	0.000	0.091	-0.014	-3.73	-1.58	1972.18	368.38			-1.25	376.50
207				-0.06	0.03	0.204	0.000	0.091	-0.014	-4.16		1972.23				-1.67	384.77
208				-0.05	0.03	0.215	0.000		-0.016			1973.06				-1.67	392.20
209				-0.05	0.04	0.215	0.000		-0.026	-4.42		1973.10				-2.04	400.65
210 211				-0.05 -0.04	0.04 0.04	0.215 0.215	0.000 0.000		-0.026 -0.028	-4.29 -4.26		1973.78 1973.33				-1.93 -2.15	408.32 417.07
212				-0.04	0.04	0.215	0.000		-0.028	-3.98		1973.72				-1.88	425.04
213	306	0.20	0.00	-0.03	0.04	0.215	0.000	0.057	-0.031	-3.93		1973.09				-2.02	433.99
214	307	0.20	0.00	-0.03	0.04	0.215	0.000	0.057	-0.031	-3.64	-2.14	1973.35	431.78			-1.76	442.09
215	308	0.20	0.00	-0.02	0.04	0.216	0.000	0.045	-0.034	-3.73	-2.35	1972.70	440.51			-1.98	451.09
Z =	= 94 ((Pu)															
115		0.17	0.00	0.00	0.00	0.183	0.000	0.012	0.001	-0.22	0.75	1557.73	55.63			0.70	57.23
116		0.16		0.01	0.00	0.173	0.000	-0.001	-0.001	-0.14		1569.07	52.36			0.87	53.89
117 118		0.15 0.15		0.01 0.02	0.00 -0.01	0.162 0.162		-0.003 -0.015	-0.001 0.007	-0.49 -0.67		1578.75 1590.01	50.75 47.57			0.53 0.42	52.20 48.95
119		0.13			-0.01	0.102		-0.013 -0.018	0.007	-0.07 -0.92		1590.01	46.35			0.42	47.65
		-0.15				-0.156		-0.014	0.012	-1.45		1610.47	43.25			-0.26	44.48
		-0.13		0.02		-0.136 -0.135		-0.014	0.012	-1.45		1619.59	42.21			-0.20 -0.70	43.37
		-0.11		0.01	0.00	-0.115	0.000	-0.007	0.001	-1.70	-1.00	1630.34	39.52			-1.01	40.62
		-0.09		0.02		-0.094	0.000	-0.020	-0.007	-2.24		1639.28	38.66			-1.61	39.70
		-0.07		0.02		-0.073	0.000	-0.021	-0.008	-2.47		1649.55	36.46			-1.76	37.44
125 126		0.00 0.00		0.00	0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-2.81 -3.00		1657.88 1667.81	36.19 34.33			-2.08 -2.23	37.13 35.21
127			0.06		0.00	0.033	-0.082	0.014	0.003	-2.94		1674.83	35.40			-1.52	36.22
128	222	0.05	0.08	-0.02	0.00	0.056	-0.110	0.027	0.006	-2.87		1683.60	34.69			-0.82	35.48
129	223	0.07	0.09	-0.02	0.00	0.078	-0.124	0.029	0.008	-2.99	-0.60	1690.78	35.58			-0.59	36.33
130				-0.03	0.01		-0.138	0.043	0.001			1699.51	34.92			-0.14	35.65
131				-0.03	0.01		-0.152	0.045	0.003	-3.57		1706.55	35.95			-0.07	36.63
132 133				-0.05 -0.05	0.01 0.01		-0.139 -0.139	0.070 0.072	0.006 0.007	-3.49 -3.75		1715.08 1722.08	35.49 36.56			0.28 0.10	36.17 37.20
134				-0.05	0.01		-0.139	0.073		-3.62		1730.41	36.31	36.09	0.032	0.35	36.94
135	229	0.18	0.00	-0.08	0.00	0.195	0.000	0.114	0.022	-3.86	0.01	1737.21	37.58	37.40	0.051	0.10	38.19
136				-0.08	0.00	0.195	0.000	0.114	0.022	-4.03		1745.62	37.24	36.93	0.015	-0.02	37.84
137				-0.08	0.00	0.195	0.000	0.114	0.022	-4.43		1752.25	38.69	38.28	0.026	-0.39	39.25
138				-0.08	0.01	0.206	0.000	0.116	0.013	-4.46		1760.30	38.71	38.37	0.018	-0.44	39.26
139				-0.08	0.01	0.206	0.000	0.116	0.013			1766.70	40.38	40.05	0.050	-0.86	40.90
140 141				-0.08 -0.07	0.02	0.216 0.215	0.000 0.000	0.119 0.106	0.004 0.001	-5.01 -4.89		1774.57 1780.64	40.58 42.58	40.35 42.18	0.007 0.021	-1.00 -1.37	41.11 43.06
141				-0.07 -0.07	0.02	0.215	0.000	0.106	0.001			1788.18	43.12	42.18	0.021	-1.37 -1.44	43.61
143				-0.07	0.03	0.226	0.000					1793.95	45.41	45.09	0.002	-1.73	45.91
144	238	0.21	0.00	-0.06	0.03	0.226	0.000	0.095	-0.012	-4.90	-1.75	1801.04	46.39	46.17	0.002	-1.63	46.89
145				-0.06	0.04	0.236	0.000					1806.57	48.93	48.59	0.002	-1.91	49.46
146				-0.05	0.04	0.237	0.000		-0.024				50.15	50.13		-1.83	50.69
147 148				-0.05 -0.04	0.04 0.04	0.237 0.237	0.000 0.000		-0.024 -0.027				52.96 54.54	52.96 54.72		-2.12 -1.93	53.50 55.10
148				-0.04 -0.04	0.04	0.237	0.000		-0.027 -0.027				57.59	57.76	0.002		58.15
150				-0.03	0.04	0.237	0.000		-0.030				59.39	59.81		-2.05	59.98
151				-0.02	0.04	0.249	0.000		-0.032				62.67	63.11		-2.34	63.27
152	246	0.23	0.00	-0.01	0.03	0.250	0.000	0.038	-0.025	-4.23	-2.15	1847.13	64.87	65.39	0.015		65.44
153	247	0.22	0.00	-0.01	0.03	0.238	0.000	0.036	-0.025	-4.02	-2.04	1851.30	68.78			-1.97	69.37

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 94 ((P11)															
	248	` '	0.00	-0.01	0.03	0.238	0.000	0.036	-0.025	-3.51	-1.59	1856.81	71.34			-1.50	71.98
	249	0.22		0.00	0.03	0.239	0.000					1860.69	75.52			-1.34	76.19
156	250	0.22	0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-2.58	-0.96	1865.97	78.32			-0.92	78.99
	251	0.22		0.01	0.02	0.240	0.000		-0.021	-2.54		1869.72	82.64			-0.84	83.35
	252	0.21	0.00	0.01	0.01	0.228	0.000		-0.011		-0.49	1874.84	85.59			-0.48	86.32
	253		0.00	0.02	0.01	0.229			-0.013			1878.67	89.84			-0.69	90.61
	254 255	0.21 0.21	0.00	0.03	0.01	0.229		-0.016		-2.13		1883.80 1887.43	92.77 97.21			-0.51 -0.74	93.61 98.10
	256		0.00	0.04 0.04	0.00	0.230 0.219			-0.009 -0.008	-2.47 -2.25			100.36			-0.74 -0.58	101.33
	257	0.20		0.04	0.00	0.219		-0.031				1895.59				-0.61	106.22
164	258	0.19	0.00	0.04	0.00	0.207	0.000	-0.033	-0.008	-1.72	-0.21	1900.03	108.83			-0.18	109.93
	259		0.00	0.03	0.00	0.185		-0.024		-1.41		1902.98					115.10
	260	0.16		0.03	0.00	0.174		-0.025		-1.02		1907.38					118.85
	261		0.00	0.02	0.00	0.173			-0.003			1910.31					124.06
	262	0.14		0.01	0.01	0.151			-0.011			1914.55					127.98
	263 264	0.12 0.12		0.00	0.01	0.129 0.129	0.000 0.000	0.007 -0.005	-0.010	-0.97 -0.97		1917.57 1921.81					133.12 137.04
		-0.12				-0.129 -0.176	0.000	-0.003	-0.011			1921.81					142.27
		-0.17				-0.176	0.000	0.001	0.010	-1.91		1928.82					146.36
		-0.13		0.00	-0.01	-0.135	0.000	0.007	0.009	-1.97	-1.07	1931.46	150.04			-1.06	151.89
174	268	-0.12	0.00	-0.01	-0.01	-0.125	0.000	0.018	0.008	-1.86	-1.05	1935.32	154.25			-1.03	156.22
		-0.11		0.00	-0.01	-0.115	0.000	0.005	0.009	-2.19		1937.90				-1.55	161.81
		-0.10				-0.105	0.000	-0.007	0.011	-2.25		1941.76					166.15
		-0.10		0.02		-0.105		-0.019	0.002	-2.78		1944.15					171.93
		-0.10				-0.105		-0.019				1947.61				-2.13	176.69
		-0.08 -0.05		0.02		-0.084 -0.053		-0.020 -0.011	0.011 0.001	-2.84 -2.36		1949.41 1952.30				-2.20 -1.80	183.09 188.36
		-0.03		0.01		-0.033 -0.032		-0.011	0.001	-2.30 -2.81		1954.22				-2.16	194.65
	276	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-2.76		1957.32					199.76
183	277	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.20	-2.52	1959.12	203.09			-2.52	206.17
184	278	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.93	-2.25	1961.85	208.43			-2.25	211.65
	279	0.01		0.00	0.00	0.011	-0.054	0.001	0.001	-2.33		1962.24				-1.40	219.51
	280	0.00		0.00	0.00	0.000	0.000	0.000				1964.35					225.60
	281 282		0.08	-0.01 -0.02	0.00 0.00		-0.109 -0.123	0.015 0.028				1965.21 1967.61					233.06 238.93
	283						-0.123										246.09
	284	0.00		-0.02 0.08	0.01	0.008		0.030 -0.033	-0.036			1968.74 1970.88					252.16
	285		0.00	0.08	0.01	0.419						1971.88					259.39
192	286	0.37	0.00	0.09	0.00	0.419	0.000	-0.047	-0.032	-3.43	-0.15	1974.04	260.81			-0.03	265.47
193	287	0.37	0.00	0.09	0.00	0.419	0.000	-0.047	-0.032	-3.66	-0.39	1974.89	268.04			-0.30	272.85
	288		0.00	0.09	0.00	0.408						1976.89					279.15
	289		0.00	0.09		0.407						1977.38					286.84
	290 291		0.00 0.00		-0.01 -0.01	0.407 0.408						1979.35 1980.07				-0.09	293.15 300.76
	291			-0.10	0.02	0.408	0.000					1980.07					307.25
	293			-0.01	0.02	0.283	0.000					1982.18					315.07
	294		0.00	0.01	0.02	0.296	0.000					1983.85					321.70
	295		0.00	0.01	0.02	0.296	0.000					1984.16					329.67
	296		0.00	0.01	0.03	0.296	0.000					1985.86					336.41
	297	0.27	0.00	0.01	0.03	0.296	0.000	0.023	-0.029	-2.81	-1.14	1986.00	337.64				344.55
	298			-0.06	0.03	0.215	0.000					1987.48					351.56
	299			-0.06	0.03	0.215	0.000					1987.62					359.71
	300 301			-0.05 -0.05	0.03	0.215 0.215	0.000 0.000					1988.92 1988.95					366.69 374.96
	302			-0.05	0.03	0.215	0.000					1990.19					382.05
	303			-0.05	0.04	0.215	0.000					1990.23					390.48
	304			-0.03	0.04	0.215	0.000					1990.23					397.84

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 94 ((Pu)															
	305		0.00	-0.04	0.04	0.215	0.000	0.069	-0.028	-4.32	-2.58	1990.79	397.42			-2.19	406.56
	306			-0.03	0.04	0.215	0.000		-0.031			1991.47				-1.95	414.20
	307			-0.03	0.04	0.215	0.000		-0.031			1990.91				-2.13	423.10
	308 309			-0.03 -0.02	0.04 0.04	0.215 0.216	0.000 0.000		-0.031 -0.034	-3.77 -3.87		1991.47 1990.83				-1.87 -2.11	430.90 439.87
	310			-0.01	0.04	0.216	0.000		-0.036			1991.33				-1.92	447.74
	311	0.20		-0.01	0.04	0.216	0.000	0.033	-0.036	-3.88		1990.68				-2.26	456.74
218	312	0.20	0.00	0.00	0.04	0.217	0.000	0.021	-0.038	-3.72	-2.61	1991.20	453.51			-2.20	464.61
\boldsymbol{Z}	= 95 ((Am)															
	212		0.00	0.01	0.00	0.173		-0.001	-0.001	-0.68		1576.65	60.15			0.36	61.80
	213		0.00		-0.01 -0.01	0.162		-0.015	0.007	-0.79		1587.91	56.96			0.28	58.54
	214 215	0.14 -0.15				0.151 -0.156		-0.016 -0.014	0.007 0.012	-0.98 -1.19		1597.54 1608.47	55.40 52.54			0.07 -0.03	56.90 53.97
		-0.14		0.02		-0.146		-0.015	0.012	-1.44		1617.90	51.19			-0.37	52.54
122	217	-0.11	0.00	0.02	0.00	-0.115	0.000	-0.018	0.002	-1.43	-0.69	1628.73	48.42			-0.71	49.71
		-0.10		0.02		-0.105		-0.019	0.002	-1.93		1638.08	47.14			-1.31	48.37
	219 220	-0.08 0.01		0.02	0.01	-0.084 0.011	0.000 -0.040	-0.021 0.000	-0.008 0.001	-2.11 -2.47		1648.40 1656.99	44.89 44.38			-1.47 -1.62	46.06 45.49
	221	0.01		0.00	0.00		-0.054	0.001	0.001	-2.79		1666.96	42.48			-1.77	43.54
	222	0.04	0.07	-0.01	0.00		-0.095	0.015	0.004	-2.87		1674.54	42.97			-1.24	43.97
	223			-0.01	0.00		-0.109	0.015	0.005	-2.47	-0.59	1683.40	42.18			-0.58	43.13
	224			-0.02	0.01		-0.137	0.030	-0.001	-3.05		1690.99	42.67			-0.36	43.57
	225 226			-0.03 -0.03	0.01		-0.138 -0.152	0.043 0.045	0.001 0.003	-2.85 -3.28		1699.76 1707.25	41.97 42.54			0.08	42.84 43.36
	227			-0.04	0.01		-0.138	0.058	0.004	-2.90		1715.85	42.01			0.40	42.81
133	228	0.14	0.09	-0.05	0.01	0.153	-0.125	0.073	0.006	-3.19		1723.17	42.77			0.30	43.53
	229			-0.07	0.00	0.206	0.000	0.103	0.020	-3.08		1731.77	42.24			0.31	42.98
	230 231			-0.08 -0.08	0.00	0.195 0.195	0.000 0.000	0.114 0.114	0.022 0.022	-3.97 -4.14		1739.08 1747.54	43.00 42.62			-0.06 -0.18	43.71 43.32
	232			-0.08	0.01	0.206	0.000	0.116	0.013	-4.53		1754.55	43.67			-0.57	44.33
	233			-0.08	0.01	0.206	0.000	0.116	0.013	-4.64	-0.86	1762.80	43.49			-0.77	44.14
	234			-0.07	0.01	0.205	0.000	0.103	0.010	-4.54		1769.55	44.82			-1.17	45.42
	235236			-0.07 -0.07	0.02 0.02	0.215 0.215	0.000 0.000	0.106 0.106				1777.48 1783.96	44.96 46.54			-1.33 -1.71	45.56 47.12
	237			-0.07	0.02	0.215	0.000	0.106				1791.54	47.04			-1.79	47.62
	238			-0.06	0.03	0.226	0.000		-0.012			1797.74	48.91	48.42	0.051	-2.15	49.47
	239			-0.06	0.03	0.226	0.000		-0.012				49.81	49.39		-2.08	50.38
	240 241			-0.06 -0.05	0.04 0.04	0.236 0.237	0.000		-0.021 -0.024				51.92 53.14	51.51 52.94	0.014 0.002	-2.42	52.52 53.73
	242			-0.05	0.04	0.237	0.000		-0.024				55.58	55.47		-2.51 -2.60	56.17
	243			-0.03 -0.04	0.04	0.237	0.000		-0.024 -0.027			1829.92	57.09	57.18	0.002	-2.45	57.69
	244	0.23	0.00	-0.03	0.04	0.249	0.000	0.063	-0.029				59.78	59.88		-2.73	60.38
	245			-0.03	0.04	0.237	0.000		-0.030				61.55	61.90	0.003	-2.56	62.18
	246			-0.02	0.04	0.249	0.000		-0.032			1846.74	64.48	65.00	0.018	-2.84	65.11
	247 248			-0.01 -0.01	0.04 0.03	0.250 0.250	0.000 0.000		-0.035 -0.025			1852.70 1857.16	66.60 70.20			-2.55 -2.44	67.27 70.83
	249		0.00	0.00	0.03	0.250	0.000		-0.027			1862.72	72.72			-2.00	73.39
	250		0.00	0.00	0.03	0.250	0.000		-0.027				76.57			-1.81	77.26
	251		0.00	0.00	0.02	0.239	0.000		-0.018				79.41			-1.32	80.10
	252253		0.00	0.01	0.02 0.01	0.240 0.228	0.000 0.000		-0.021 -0.011			1876.34	83.31 86.26			-1.30 -0.91	84.03 87.00
	254		0.00	0.01	0.01	0.228		-0.008					90.20			-0.91 -1.07	90.98
160	255		0.00	0.03	0.01	0.229	0.000	-0.016	-0.016	-2.50	-0.90	1890.73	93.13			-0.88	93.98
161	256		0.00	0.04	0.00	0.230		-0.030					97.23			-1.10	98.11
	257		0.00	0.04	0.00	0.230						1899.62				-0.91	101.33
	258259		0.00	0.04	0.00	0.219 0.207						1903.22 1907.65				-0.95 -0.49	105.87 109.57
104	237	0.19	0.00	0.04	0.00	0.207	0.000	0.033	0.000	2.07	0.01	1701.03	100.72			0.72	107.31

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 95 ((Am)															
	260	0.18	0.00	0.03	0.00	0.196	0.000	-0.023	-0.005	-1.74	-0.41	1910.91	113.31			-0.41	114.44
166	261	0.16	0.00	0.02	0.00	0.173		-0.013				1915.26				-0.09	118.22
	262	0.16		0.02	0.00	0.173			-0.003			1918.54					123.08
	263	0.16		0.02	0.00	0.173	0.000		-0.003			1922.77					127.00
	264	0.13		0.00	0.01	0.140	0.000		-0.010	-1.11		1926.05				-0.27	131.89
	265	0.12		0.00	0.01	0.129	0.000		-0.010	-0.99		1930.28					135.82
	266 267	0.12 -0.17		0.01	0.01	0.129 -0.176	0.000 0.000	-0.005 0.001	-0.011 0.010	-1.43 -1.83		1933.45 1937.53				-0.62 -0.62	140.80 144.88
173		-0.17				-0.135	0.000	0.007	0.009	-1.87		1940.46				-0.97	
174	269	-0.12	0.00	-0.01	-0.01	-0.125	0.000	0.018	0.008	-1.73	-0.93	1944.31	152.55			-0.92	154.44
175	270	-0.11	0.00	0.00	-0.01	-0.115	0.000	0.005	0.009	-2.05	-1.42	1947.21	157.72			-1.42	159.71
		-0.10		0.01	-0.01	-0.105	0.000	-0.007	0.011	-2.08		1951.06				-1.55	164.05
177		-0.10		0.02		-0.105		-0.019		-2.61		1953.78				-2.05	169.51
		-0.10 -0.08		0.02 0.01		-0.105 -0.084		-0.019 -0.009	0.012 0.001			1957.25 1959.31					174.25 180.34
		-0.07 -0.04		0.02 0.01		-0.073 -0.042	0.000	-0.021 -0.011	0.002 0.001	-2.26 -2.46		1962.35 1964.38				-1.69 -1.85	185.51 191.67
	277	0.04		0.00	0.00	0.042	0.000	0.000	0.001	-2.28		1967.36					196.89
183	278	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-2.70		1969.47				-2.06	202.98
184	279	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-2.44	-1.78	1972.20	205.38			-1.78	208.47
	280	0.01	0.05	0.00	0.00		-0.067	0.001	0.002	-2.17		1973.11				-1.12	
186		0.01		0.00	0.00		-0.067	0.001	0.002	-1.48		1975.28				-0.46	221.85
	282 283		0.09		0.00	0.035	-0.123	0.016 0.029	0.006 -0.002	-2.34		1976.63					228.79
	284	0.03	0.10	-0.02 0.08	0.01	0.057	-0.136 0.000		-0.002 -0.036	-2.38 -3.38		1978.98 1980.33				0.03 -0.17	234.72 241.53
	285	0.37		0.08	0.01	0.419			-0.036			1982.69				0.01	247.43
	286	0.37		0.08	0.00	0.419			-0.030 -0.032	-3.18		1983.94				-0.22	254.37
	287	0.37		0.09	0.00	0.419			-0.032			1986.21				-0.11	260.37
	288	0.37		0.09	0.00	0.419			-0.032			1987.33				-0.34	267.47
194	289	0.36	0.00	0.09	0.00	0.408			-0.031		-0.22	1989.35	268.94			-0.12	273.75
	290		0.00	0.09	-0.01	0.407			-0.022			1990.33				-0.41	280.94
196	291 292		0.00	-0.03 -0.02	0.01	0.260 0.261	0.000 0.000	0.063	0.002 -0.001	-2.28		1992.37 1993.25				-0.41 -0.72	287.15
	293			-0.02	0.01	0.201	0.000		-0.001								300.88
	294			-0.01	0.02	0.272	0.000		-0.014							-0.96	
200	295	0.27	0.00	0.01	0.02	0.296	0.000	0.022	-0.019	-2.55	-0.90	1997.60	309.12			-0.90	314.99
201		0.27		0.01	0.02	0.296	0.000	0.022	-0.019	-2.81	-1.16	1998.19	316.59			-1.17	
202		0.27		0.01	0.03	0.296	0.000		-0.029			1999.93				-1.16	
203		0.26		0.00	0.03	0.284	0.000		-0.026			2000.43				-1.49	
204		0.25		0.00	0.03	0.273	0.000		-0.027			2001.77				-1.33	
205 206				-0.02 -0.05	0.03	0.249 0.215	0.000 0.000		-0.022 -0.016			2002.07 2003.48				-1.57 -1.52	
207				-0.05	0.03	0.215	0.000		-0.016							-1.93	367.07
208				-0.05	0.04	0.215	0.000		-0.026							-1.94	
209	304	0.20	0.00	-0.05	0.04	0.215	0.000	0.082	-0.026	-4.73	-2.72	2005.35	374.00			-2.32	382.32
210	305	0.20	0.00	-0.04	0.04	0.215	0.000	0.069	-0.028	-4.41	-2.64	2006.33	381.10			-2.26	389.64
211				-0.04	0.04	0.215	0.000		-0.028			2006.23				-2.49	398.06
212				-0.03	0.04	0.215	0.000		-0.031			2006.90				-2.23	405.71
213 214				-0.03 -0.02	0.04	0.215 0.216	0.000 0.000		-0.031 -0.034	-4.35 -3.94		2006.62 2007.18				-2.42 -2.16	
	310			-0.02	0.04	0.216	0.000		-0.034			2006.85					
216				-0.02 -0.01	0.04	0.216	0.000		-0.034 -0.036			2000.83				-2.42 -2.23	430.76
217				-0.01	0.04	0.216	0.000					2006.99				-2.57	447.32
218	313	0.21	0.00	0.00	0.04	0.228	0.000		-0.038	-4.11	-2.92	2007.53	444.47			-2.54	455.15
219		0.21	0.00	0.01	0.04	0.229	0.000	0.011	-0.041	-4.44	-3.26	2007.05	453.02			-2.85	464.02
220	315	0.21	0.00	0.01	0.04	0.229	0.000	0.011	-0.041	-4.30	-3.14	2007.37	460.78			-2.72	472.08

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 96 ((Cm)															
	215	0.14	0.00	0.02	-0.01	0.151	0.000	-0.016	0.007	-1.06	-0.00	1597.16	63.07			-0.03	64.80
120		-0.15	0.00			-0.156		-0.014	0.012	-1.08		1608.32	59.98			0.05	61.63
121		-0.14		0.02		-0.146		-0.015		-1.33		1617.79	58.58			-0.29	60.16
122 123		-0.11 -0.10		0.02		-0.115 -0.105		-0.018 -0.019		-1.32 -1.81		1629.02 1638.39	55.42 54.12			-0.62 -1.20	56.93 55.56
	220	-0.08		0.02		-0.084	0.000	-0.021	-0.008	-1.98		1649.11	51.47			-1.35	52.84
125	221	0.02	0.03	0.00	0.00	0.022		0.001	0.001	-2.36	-1.53	1657.77	50.89			-1.53	52.20
	222 223	0.00		0.00	0.00		-0.040 -0.095	0.000	0.001	-2.53		1668.11	48.61			-1.64	49.86
	223			-0.01 -0.01	0.00 0.00		-0.093 -0.109	0.014 0.015	0.004 0.005	-2.68 -2.24		1675.70 1684.92	49.10 47.95			-1.08 -0.37	50.28 49.09
	225			-0.02	0.01		-0.123	0.029	-0.003	-2.32		1692.47	48.47			-0.08	49.55
130	226	0.08	0.10	-0.03	0.01	0.089	-0.138	0.043	0.001	-2.41	0.38	1701.60	47.41			0.41	48.46
	227			-0.03	0.01		-0.152	0.044		-2.79		1709.06	48.02			0.49	49.02
	228 229			-0.05 -0.06	0.01	0.132	-0.111 0.000	0.072 0.092		-2.10 -2.12		1718.01 1725.46	47.15 47.77			0.85 0.63	48.11 48.67
	230			-0.07	0.00	0.206	0.000	0.103	0.020	-2.76		1734.66	46.64			0.46	47.54
	231			-0.07	0.00	0.206	0.000	0.103	0.020	-3.18	0.02	1742.00	47.37			0.08	48.22
	232			-0.07	0.01	0.205	0.000	0.103	0.010	-3.23		1750.82	46.62	47.20	0.072	-0.04	47.44
	233 234			-0.07 -0.07	0.01	0.205 0.205	0.000 0.000	0.103 0.103	0.010 0.010	-3.65 -3.80		1757.89 1766.43	47.63 47.16	47.29 46.72	0.072 0.018	-0.43 -0.54	48.41 47.93
	235			-0.07	0.02	0.215	0.000	0.106	0.001	-4.32		1773.26	48.39	10.72	0.010	-0.97	49.13
	236			-0.07	0.02	0.215	0.000	0.106	0.001	-4.51		1781.57	48.15			-1.13	48.88
	237			-0.07	0.02	0.215	0.000	0.106	0.001	-4.93		1788.09	49.71	40.40	0.025	-1.50	50.41
	238 239			-0.06 -0.06	0.03	0.226 0.226	0.000 0.000	0.095 0.095	-0.012 -0.012			1796.15 1802.40	49.72 51.54	49.40	0.037	-1.69 -2.06	50.42 52.22
	240			-0.05	0.03	0.237	0.000		-0.012			1809.97	52.04	51.72	0.002	-2.04	52.71
	241			-0.05	0.04	0.237	0.000	0.086	-0.024	-5.48		1816.03	54.05	53.70	0.002	-2.44	54.74
	242			-0.05	0.04	0.237	0.000		-0.024	-5.39		1823.28	54.87	54.81	0.002	-2.35	55.57
	243 244			-0.04 -0.03	0.04	0.248 0.249	0.000 0.000		-0.026 -0.029	-5.54 -5.20		1828.99 1835.95	57.23 58.35	57.18 58.45	0.002 0.002	-2.69 -2.56	57.91 59.03
	245			-0.03	0.04	0.249	0.000		-0.029	-5.55		1841.42	60.94	61.01	0.002	-2.90	61.63
	246			-0.02	0.04	0.249	0.000		-0.032	-5.28		1848.16	62.28	62.62	0.002	-2.80	62.99
	247			-0.01	0.04	0.250	0.000			-5.49		1853.34	65.17	65.53		-3.09	65.88
	248 249			-0.01 -0.01	0.04 0.03	0.250 0.238	0.000 0.000		-0.035 -0.025				66.86 70.45	67.39 70.75		-2.86 -2.74	67.60 71.15
	250	0.23		0.00	0.03	0.250	0.000		-0.027				72.60	72.99	0.011	-2.30	73.33
	251	0.22		0.00	0.03	0.239	0.000		-0.028	-4.01		1874.38	76.41	76.65	0.023	-2.12	77.16
	252	0.22		0.01	0.02	0.240	0.000		-0.021			1880.01	78.85			-1.67	79.60
	253254	0.22 0.21		0.01	0.02	0.240 0.228	0.000		-0.021 -0.021			1884.23 1889.78	82.71 85.23			-1.68 -1.33	83.48 86.04
	255	0.21		0.02	0.01	0.229			-0.013			1893.84	89.24			-1.42	90.06
	256	0.21		0.03	0.01	0.229			-0.016			1899.36	91.79			-1.26	92.67
	257	0.21		0.04	0.00	0.230			-0.009			1903.35	95.88			-1.47	96.79
	258 259	0.21 0.20		0.04 0.04	0.00 0.00	0.230 0.219			-0.009 -0.008			1908.61 1912.20	98.68 103.17			-1.28 -1.29	99.65 104.19
	260	0.19		0.04	0.00	0.207						1916.94					107.58
	261	0.18		0.04	0.00	0.196			-0.007			1920.19				-0.67	112.46
	262	0.17		0.03	0.00	0.185			-0.005			1924.83					115.95
	263 264	0.16 0.16		0.02 0.02	0.01	0.173 0.173						1928.22 1932.66					120.70 124.39
	265	0.13		0.02	0.00	0.173						1935.87					129.33
	266	0.13		0.01	0.01	0.129			-0.011			1940.41					132.95
	267	0.12		0.01	0.01	0.129						1943.61					137.89
	268 269	0.12 0.12		0.01 0.02	0.00 0.00	0.129 0.129						1947.90 1950.91					141.75 146.91
	270	0.12			-0.00	0.129		-0.013				1955.01				-0.81	
		-0.12				-0.129	0.000	0.005				1957.91					156.25

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 96 ((Cm)															
		-0.10	0.00	0.01	-0.01	-0.105	0.000	-0.007	0.011	-1.97	-1.45	1962.08	158.21			-1.44	160.26
		-0.10		0.02		-0.105		-0.019	0.002	-2.49		1964.81				-1.94	165.70
		-0.10 -0.08		0.02		-0.105 -0.084		-0.019 -0.021	0.012 0.002	-2.43 -2.42		1968.60 1970.67					170.11 176.20
		-0.08 -0.07		0.02		-0.084 -0.073		-0.021 -0.021	-0.002	-2.42 -2.14		1970.07				-1.56	181.05
	277			0.01	0.00	-0.042			0.001			1976.10				-1.75	187.14
	278		0.00	0.00	0.00	0.000	0.000	0.000	0.001	-2.21		1979.45				-1.60	191.99
183	279	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.61	-1.97	1981.55	195.24			-1.97	198.09
	280	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-2.31		1984.58				-1.68	203.26
	281	0.01		0.00	0.00	0.012		0.001	0.002	-1.99		1985.44				-0.95	210.64
	282 283	0.01	0.06	0.00 -0.01	0.00		-0.081 -0.123	0.002 0.016	0.002	-1.52 -2.21		1987.96 1989.21				-0.30 -0.10	216.35 223.37
	284			-0.01 -0.02	0.00			0.010	-0.002	-2.21 -2.20		1909.21				0.10	228.90
	285			-0.02	0.01	0.068	-0.150	0.030	0.000	-2.76		1993.32				0.07	235.76
190	286	0.37	0.00	0.08	0.01	0.419	0.000	-0.033	-0.036	-2.74	0.25	1995.81	237.48			0.38	241.47
	287	0.37		0.08	0.01	0.419		-0.033		-3.00		1997.17				0.08	248.32
	288	0.36		0.08	0.00	0.406	0.000	-0.038	-0.027	-2.67		1999.61				0.25	254.06
	289 290			-0.03 -0.03	0.00	0.249	0.000 0.000	0.060 0.061	0.012	-1.80 -1.74		2000.73 2003.23				0.03	261.15 266.90
	291			-0.03	0.01	0.249	0.000	0.061	0.001	-2.13		2004.38				-0.35	273.99
196	292	0.23	0.00	-0.03	0.01	0.249	0.000	0.061	0.001	-2.14	-0.39	2006.76	274.96			-0.36	279.87
197	293	0.23	0.00	-0.03	0.01	0.249	0.000	0.061	0.001	-2.46	-0.70	2007.70	282.09			-0.69	287.18
	294			-0.02	0.02	0.260	0.000	0.051	-0.011	-2.33		2009.88				-0.64	293.28
	295			-0.01	0.02	0.272	0.000	0.041	-0.014	-2.57		2010.65				-0.95	300.75
	296		0.00	0.00	0.02	0.284	0.000		-0.016			2012.64				-0.89	307.03
	297 298		0.00	0.01	0.02	0.284 0.285	0.000		-0.020 -0.030	-2.76 -2.93		2013.29 2015.33				-1.20 -1.19	314.64 321.02
	299	0.25		0.00	0.03	0.273	0.000		-0.027	-3.19		2015.88				-1.56	328.73
	300	0.24	0.00	-0.01	0.03	0.261	0.000	0.040	-0.024			2017.50				-1.40	335.41
205	301	0.23	0.00	-0.02	0.03	0.249	0.000	0.050	-0.022	-3.39	-1.81	2017.84	336.52			-1.67	343.36
	302			-0.03	0.04	0.237	0.000		-0.030			2019.58				-1.59	350.11
	303 304			-0.04 -0.04	0.04	0.226 0.226	0.000 0.000		-0.028 -0.028	-4.19		2019.92 2021.43				-1.98 -1.99	358.09 364.89
	305			-0.04	0.04	0.226	0.000					2021.49					373.04
	306			-0.04	0.04	0.215	0.000	0.069	-0.028	-4.44	-2.68	2022.91	371.80				380.05
211	307	0.20	0.00	-0.04	0.04	0.215	0.000	0.069	-0.028	-4.66	-2.89	2022.80	379.98			-2.52	388.47
	308			-0.03	0.04	0.215	0.000					2023.80					395.78
	309			-0.03 -0.02	0.04	0.215	0.000					2023.53					404.37
	310 311			-0.02	0.04	0.216 0.216	0.000					2024.41 2024.08				-2.27 -2.53	411.83 420.48
	312			-0.01	0.04	0.216	0.000					2024.91					428.00
	313			-0.01	0.04	0.216	0.000					2024.56					436.69
	314		0.00	0.00	0.04	0.228	0.000					2025.35					444.26
	315		0.00	0.01	0.04	0.229	0.000					2024.87				-2.98	
	316		0.00	0.01	0.04	0.229	0.000					2025.47					460.89
	317 318		0.00	0.01 0.02	0.04 0.03	0.218 0.218	0.000					2024.71 2024.83				-3.03 -2.73	
	= 97 (
		-0.13	0.00	0.02	-0.01	-0.136	0.000	-0.016	0.012	-1.15	-0.19	1615.53	68.13			-0.22	69.93
		-0.11		0.02		-0.115		-0.018				1626.75	64.99			-0.49	66.71
		-0.10		0.02		-0.105		-0.019				1636.50	63.31			-1.03	64.96
		-0.09		0.03		-0.094		-0.032				1647.25	60.63 50.67			-1.18	62.21
	222	0.03		0.00	0.00		-0.054	0.001				1656.27	59.67			-1.32	61.19
	223 224		0.05	0.00 -0.01	0.00		-0.067 -0.095	0.001 0.014				1666.64 1674.71	57.38 57.38			-1.41 -0.93	58.82 58.76
	225			-0.01	0.00		-0.109	0.014				1684.00	56.15			-0.27	57.48
	226			-0.02	0.01		-0.137		-0.001			1691.93	56.30			0.05	57.56

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
$oldsymbol{Z}$:	= 97 ((Bk)															
130	227	0.08	0.10	-0.02	0.01	0.089	-0.137	0.030	-0.001	-2.04	0.64	1700.97	55.33			0.65	56.54
131	228	0.09	0.11	-0.03	0.01	0.101	-0.152	0.044	0.002	-2.89		1709.15	55.22			0.42	56.38
132				-0.05	0.00	0.227	0.000	0.081		-1.87		1718.49	53.95			0.40	55.05
	230			-0.05	0.00	0.227	0.000	0.081		-2.13 -2.40		1726.39	54.13			0.13	55.17
134				-0.06	0.01	0.216	0.000	0.093	0.008			1735.35	53.24			0.22	54.25
135 136				-0.06 -0.06	0.01	0.216 0.216	0.000 0.000	0.093	0.008 0.008	-2.78 -2.97		1743.00 1751.90	53.66 52.83			-0.08 -0.23	54.63 53.77
137				-0.06	0.01	0.216	0.000	0.093	0.008	-2.97 -3.39		1751.90	53.46			-0.23 -0.61	54.36
138				-0.06	0.02	0.215	0.000	0.093	-0.002	-3.58		1767.96	52.91			-0.76	53.79
139	236	0.20	0.00	-0.06	0.02	0.215	0.000	0.093	-0.002	-4.05	-1.23	1775.19	53.76			-1.20	54.60
140	237	0.21	0.00	-0.06	0.02	0.226	0.000	0.095	-0.001	-4.38	-1.46	1783.59	53.43			-1.42	54.26
141				-0.05	0.03	0.237	0.000		-0.014	-4.58		1790.49	54.60			-1.80	55.39
142 143				-0.06	0.03	0.226	0.000		-0.012			1798.63	54.52			-2.03	55.33
143				-0.05 -0.05	0.03	0.237 0.237	0.000		-0.014 -0.024			1805.36 1813.04	55.87 56.26			-2.51 -2.52	56.63 57.06
145				-0.05	0.04	0.237	0.000		-0.024			1819.38	57.99			-2.86	58.76
145				-0.05 -0.04	0.04	0.237	0.000		-0.024 -0.027			1819.38	58.74	58.69	0.005	-2.80 -2.81	58.76 59.51
147				-0.04	0.04	0.237	0.000		-0.027	-5.89		1832.78	60.73	60.72	0.014	-3.14	61.49
148	245	0.23	0.00	-0.03	0.04	0.249	0.000	0.063	-0.029	-5.69		1839.85	61.73	61.81	0.002	-3.10	62.50
149	246	0.23	0.00	-0.02	0.04	0.249	0.000	0.051	-0.032	-5.89	-3.51	1845.68	63.97	63.97	0.060	-3.43	64.73
150				-0.02	0.04	0.249	0.000		-0.032	-5.83		1852.51	65.22	65.49	0.006	-3.38	66.00
151				-0.01	0.04	0.250	0.000		-0.035			1858.06	67.74	60.0 5	0.002	-3.68	68.51
152 153	249		0.00	-0.01	0.04 0.03	0.250 0.250	0.000 0.000		-0.035 -0.027	-5.81 -5.36		1864.47 1869.32	69.40 72.62	69.85 72.95	0.003 0.004	-3.46 -3.34	70.20 73.37
154			0.00	0.00	0.03	0.250	0.000		-0.027 -0.027	-3.30 -4.87		1875.26	74.76	75.23		-3.34 -2.88	75.54
155			0.00	0.01	0.03	0.251	0.000		-0.030	-4.66		1879.87	78.21	73.23	0.011	-2.70	79.01
156			0.00	0.01	0.03	0.231	0.000		-0.030 -0.031	-4.00		1885.56	80.59			-2.70 -2.24	81.43
157			0.00	0.01	0.02	0.240	0.000		-0.021	-3.85		1890.09	84.13			-2.25	84.94
158	255	0.22	0.00	0.02	0.02	0.240	0.000	-0.001	-0.023	-3.52	-1.93	1895.68	86.62			-1.90	87.48
159	256	0.21	0.00	0.02	0.01	0.229	0.000	-0.004	-0.013	-3.45	-1.93	1900.03	90.34			-1.94	91.19
160			0.00	0.03	0.01	0.229			-0.016			1905.58	92.86			-1.78	93.77
161			0.00	0.04	0.01	0.230		-0.028		-3.77		1909.90	96.61			-1.95	97.57
162	259		0.00 0.00	0.04 0.04	0.00 0.00	0.230 0.219			-0.009			1915.16	99.42 103.57			-1.76	100.41 104.61
164			0.00	0.04	0.00	0.219						1923.82					108.00
165		0.18	0.00	0.04	0.00	0.196						1927.37					112.57
166			0.00	0.03	0.00	0.185						1931.99					116.08
167	264	0.16	0.00	0.02	0.01	0.173	0.000	-0.013	-0.013	-1.86	-0.81	1935.68	119.26			-0.81	120.53
168			0.00	0.02	0.01	0.173						1940.16					124.19
169			0.00	0.01	0.01	0.151						1943.59					128.88
170			0.00	0.01	0.01	0.140						1948.14					132.49
171 172			0.00 0.00	0.01 0.01	0.01	0.129 0.129						1951.63 1955.92					137.14 140.99
	270		0.00	0.01	0.00	0.129						1959.25					145.82
174			0.00		-0.01	0.129		-0.031				1963.38					149.88
175	272	0.12	0.00	0.03	-0.01	0.129	0.000	-0.031	0.006	-2.15	-1.24	1966.41	153.10			-1.22	155.01
		-0.10		0.01		-0.105		-0.008				1970.61					158.95
		-0.10		0.02		-0.105		-0.019				1973.69					164.04
		-0.10		0.02		-0.105		-0.019				1977.45					168.46
		-0.08		0.02		-0.084		-0.021				1979.83					174.26
		-0.07		0.02		-0.073		-0.021				1983.19					179.09
		-0.05 -0.02		0.02 0.01		-0.052 -0.021		-0.022 -0.012				1985.56 1988.79					184.91 189.85
	280	0.01		0.00	0.00		-0.013	0.000				1988.79					195.64
184			0.02	0.00	0.00		-0.027	0.000				1994.23					200.80
185				-0.01	0.00	0.023	-0.081	0.013				1995.61					207.66
186				-0.01	0.00		-0.095	0.014				1998.20					213.29

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 97 ((Rk)															
	284	` ′	0.09	-0.01	0.00	0.035	-0.123	0.016	0.006	-2.17	-0.19	1999.80	216.57			-0.10	219.94
188	285	0.05	0.10	-0.02	0.01		-0.136	0.029	-0.002		0.20	2002.41	222.02			0.34	225.58
	286			-0.02		0.057	-0.136	0.029	-0.002			2004.09				0.20	232.12
	287			-0.03		0.249	0.000	0.060	0.012	-1.54		2006.79				0.24	237.54
	288			-0.03		0.249	0.000	0.060	0.012	-1.82		2008.43				-0.02	244.11
	289			-0.03		0.249	0.000	0.061	0.001			2011.07				0.01	249.70
	290 291			-0.03 -0.03		0.249 0.249	0.000 0.000	0.061 0.061	0.001	-2.03 -2.06		2012.57 2015.14				-0.26 -0.31	256.43 262.10
	292			-0.03		0.249	0.000	0.061	0.001	-2.41		2016.55				-0.64	268.92
196	293			-0.02		0.261	0.000	0.051	-0.001	-2.27		2018.90				-0.65	274.80
197	294	0.24	0.00	-0.02	0.02	0.260	0.000	0.051	-0.011	-2.66	-0.98	2020.17	276.91			-0.96	281.81
	295	0.24	0.00	-0.02	0.02	0.260	0.000					2022.33				-0.90	287.91
	296			-0.01		0.272	0.000					2023.47				-1.28	295.00
	297 298		0.00	0.01		0.284	0.000					2025.48 2026.54				-1.21	301.27
			0.00	0.01		0.284	0.000									-1.64	308.46
	299 300		0.00	0.01		0.285 0.273	0.000 0.000					2028.60 2029.39				-1.65 -1.96	314.80 322.27
	301			-0.00		0.273	0.000					2029.39				-1.90 -1.86	328.88
	302			-0.02		0.249	0.000					2031.82				-2.09	336.57
206	303	0.23	0.00	-0.02	0.04	0.249	0.000	0.051	-0.032	-3.96	-2.32	2033.40	336.32			-2.02	343.29
207	304	0.22	0.00	-0.02	0.04	0.238	0.000	0.049	-0.032	-4.26	-2.63	2033.93	343.86			-2.33	351.05
208	305	0.21	0.00	-0.03	0.04	0.226	0.000	0.059	-0.030	-4.31	-2.62	2035.42	350.45			-2.29	357.89
	306			-0.03		0.226	0.000					2035.88				-2.67	365.72
	307 308			-0.03 -0.03		0.226	0.000 0.000		-0.030			2037.14 2037.35				-2.56 -2.80	372.77 380.88
						0.215											
	309 310			-0.03 -0.02		0.215 0.216	0.000			-4.55 -4.61		2038.39 2038.42				-2.60 -2.81	388.17 396.44
	311			-0.02		0.216	0.000		-0.034			2039.32				-2.61	403.87
	312			-0.01		0.227	0.000					2039.29				-2.88	412.21
216	313	0.20	0.00	-0.01	0.04	0.216	0.000	0.033	-0.036	-4.41	-3.10	2040.14	410.29			-2.74	419.72
217	314	0.21	0.00	0.00	0.04	0.228	0.000	0.023	-0.038			2040.12				-3.14	428.07
	315		0.00	0.00		0.228	0.000		-0.038			2040.89				-3.06	435.65
	316		0.00	0.01		0.229	0.000					2040.71					
	317 318		0.00		0.04 0.03	0.229 0.229	0.000					2041.30 2040.63					451.97 460.80
	319		0.00		0.03	0.218						2040.94					468.87
	320		0.00	0.02		0.218						2040.34					477.85
	321		0.00		0.02	0.207						2040.24					486.13
7	= 98 ((Cf)															
		-0.10	0.00	0.02	0.00	-0.105	0.000	-0.019	0.002	-1.66	-1.07	1636.12	70.97			-1.08	72.85
		-0.08				-0.084			-0.002				67.89			-1.22	69.70
125	223	0.03	0.04	0.00	0.00	0.033	-0.054	0.001	0.001	-2.26	-1.37	1656.36	66.88			-1.38	68.61
	224		0.05		0.00		-0.067	0.001				1667.12	64.18			-1.47	65.85
127	225	0.03	0.07	-0.01	0.00	0.034	-0.095	0.014	0.004	-2.47	-0.92	1675.17	64.20			-0.92	65.80
	226			-0.01			-0.108		-0.005			1684.80	62.65			-0.19	64.18
	227 228			-0.01 -0.02			-0.122 -0.137		-0.004 -0.001			1692.70 1702.26	62.82 61.33			0.19 0.68	64.28 62.75
	229			-0.02 -0.02		0.079	0.000	0.054		-1.94 -1.24		1702.20	61.25			0.08	62.73
	230			-0.02		0.260	0.000	0.063		-1.34		1720.22	59.51			0.38	60.77
	231			-0.03		0.260	0.000	0.063		-1.60		1728.16	59.65			0.12	60.85
	232			-0.05		0.227	0.000	0.082		-2.01		1737.61	58.26			0.12	59.45
135	233			-0.05		0.227	0.000	0.082		-2.20		1745.17	58.78			-0.05	59.91
	234			-0.05		0.227	0.000	0.082				1754.29	57.73			-0.04	58.83
	235			-0.06		0.216	0.000	0.093				1761.76	58.33			-0.39	59.40
	236			-0.05		0.226	0.000		-0.004				57.38			-0.58	58.42
	237			-0.05		0.226	0.000		-0.004				58.18			-1.02	59.17
140	238	0.21	0.00	-0.05	0.02	0.226	0.000	0.082	-0.004	-3./5	-1.29	1/80.83	57.46			-1.26	58.43

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 98 ((Cf)															
	239		0.00	-0.05	0.03	0.237	0.000	0.085	-0.014	-4.40	-1.82	1793.94	58.44			-1.78	59.38
	240			-0.05	0.03	0.237	0.000		-0.014	-4.63		1802.44	58.00			-2.00	58.94
	241			-0.05	0.04	0.237	0.000		-0.024			1809.15	59.37			-2.40	60.30
	242 243			-0.04	0.04	0.237	0.000		-0.027			1817.20	59.39	59.34	0.037	-2.43	60.31
				-0.04	0.04	0.237	0.000		-0.027			1823.61	61.05	<i>C</i> 1. 40	0.002	-2.82	61.94
	244 245			-0.03 -0.03	0.04 0.04	0.249	0.000 0.000		-0.029 -0.029	-5.31 -5.73		1831.34 1837.51	61.39 63.29	61.48 63.39	0.003	-2.81 -3.19	62.28 64.16
	246			-0.03	0.04	0.249	0.000					1844.94	63.93	64.09	0.003	-3.13	64.81
149	247	0.23	0.00	-0.02	0.04	0.249	0.000	0.051			-3.63	1850.88	66.06	66.14	0.008	-3.55	66.93
150	248	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-5.81	-3.59	1858.07	66.95	67.24	0.005	-3.49	67.83
	249			-0.01	0.04	0.250	0.000			-6.17		1863.71	69.38	69.73	0.002	-3.84	70.25
	250		0.00	0.00	0.04	0.250	0.000		-0.037			1870.50	70.66	71.17	0.002	-3.64	71.55
	251 252		0.00 0.00	0.00	0.04 0.03	0.250 0.251	0.000 0.000		-0.037 -0.030	-5.80		1875.46 1881.69	73.77 75.61	74.14 76.03	0.004 0.005	-3.54 -3.08	74.67 76.48
	253		0.00	0.01	0.03	0.240	0.000		-0.031	-4.81		1886.36	79.01	79.30	0.006	-2.93	79.89
156	254	0.22	0.00	0.01	0.03	0.240	0.000	0.012	-0.031	-4.31	-2.55	1892.42	81.02	81.34	0.012	-2.48	81.93
	255	0.22	0.00	0.02	0.02	0.240	0.000	-0.001	-0.023		-2.53	1897.00	84.52			-2.50	85.41
	256		0.00	0.02	0.02	0.240			-0.023	-3.77		1902.94	86.65			-2.17	87.57
	257		0.00	0.03	0.01	0.229			-0.016	-3.84		1907.43	90.23			-2.30	91.15
	258		0.00	0.03	0.01	0.229			-0.016			1913.35	92.38			-2.17	93.35
	259 260		0.00 0.00	0.04	0.01	0.230 0.230		-0.028 -0.041	-0.018			1917.65 1923.28	96.15 98.60			-2.30 -2.10	97.16 99.65
	261		0.00	0.05	0.00	0.230			-0.011			1923.28	102.71			-2.10 -2.11	103.81
	262		0.00	0.05	0.00	0.219			-0.010			1932.32				-1.59	106.85
165	263	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007	-2.90	-1.39	1935.83	110.25			-1.38	111.43
166	264	0.18	0.00	0.04	0.00	0.196	0.000	-0.034	-0.007		-0.93	1940.76	113.40			-0.91	114.64
	265		0.00	0.03	0.00	0.174		-0.025		-2.16		1944.43					119.07
	266 267		0.00	0.02	0.01	0.173 0.151		-0.013	-0.013 -0.013			1949.24 1952.67				-0.67 -0.77	122.41 127.11
	268	0.14		0.02	0.01	0.131			-0.013 -0.011			1957.52					130.39
	269		0.00	0.01	0.01	0.129			-0.011			1961.04					135.02
	270		0.00	0.02	0.00	0.129				-1.71		1965.70					138.49
	271		0.00	0.02	0.00	0.129			-0.002			1969.03				-1.29	143.31
	272		0.00	0.03	-0.01	0.129		-0.031				1973.48					147.04
	273	0.10			-0.01	0.108		-0.044				1976.41				-1.27	
		-0.10 -0.10		0.01		-0.105 -0.105		-0.007 -0.019	0.011 0.002			1980.92				-1.42 -1.91	155.91 161.00
		-0.10 -0.10				-0.105 -0.105		-0.019 -0.019				1983.98 1988.09					165.08
		-0.08		0.02		-0.084		-0.021		-2.33		1990.47				-1.79	
180	278	-0.07	0.00	0.02	0.00	-0.073	0.000	-0.021	0.002	-2.00	-1.45	1994.13	173.02			-1.44	175.37
		-0.04		0.01		-0.042		-0.011	0.001	-2.17		1996.50					181.17
	280	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-1.98		2000.16				-1.41	185.69
	281 282		0.00	0.00	0.00	0.000	0.000 0.000	0.000	0.000	-2.31 -1.96		2002.52 2005.85				-1.71 -1.39	191.52
	283		0.06	0.00	0.00		-0.081	0.000		-1.90 -2.01		2003.83					203.28
	284		0.07	0.00	0.00		-0.094	0.002				2010.08				-0.18	208.60
	285			-0.01	0.00		-0.123	0.016	0.006	-2.10		2011.69				-0.03	215.24
	286			-0.01	0.01		-0.135	0.016	-0.003		0.35	2014.54	217.19			0.47	220.63
	287			-0.02	0.01		-0.136	0.029	-0.002			2016.25					227.13
	288			-0.03	0.01	0.249	0.000	0.061		-1.33		2019.26				0.37	232.23
	289			-0.03	0.01	0.249	0.000	0.061		-1.61		2020.92					238.78
	290 291			-0.03 -0.03	0.01	0.249 0.249	0.000 0.000	0.061 0.061	0.001	-1.59 -1.92		2023.90 2025.47				0.11 -0.22	244.03 250.68
	292			-0.03	0.01	0.249	0.000	0.061	0.001			2023.47				-0.22 -0.17	256.13
	293			-0.02	0.01	0.261	0.000		-0.001			2029.65					
196	294	0.24	0.00	-0.02	0.02	0.260	0.000	0.051	-0.011	-2.17	-0.58	2032.39	263.91			-0.53	268.49
197	295	0.24	0.00	-0.02	0.02	0.260	0.000	0.051	-0.011	-2.51	-0.91	2033.67	270.70			-0.88	275.44

N	A	ε_2	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 98 ((Cf)															
	- 29 6		0.00	-0.01	0.02	0.272	0.000	0.041	-0.014	-2.44	-0.91	2036.18	276.26			-0.88	281.17
	297		0.00	0.00	0.02	0.273	0.000		-0.017			2037.31				-1.23	288.28
	298	0.26	0.00	0.01	0.02	0.284	0.000	0.020	-0.020	-2.77	-1.28	2039.71	288.88			-1.25	294.15
	299		0.00	0.01	0.03	0.285	0.000			-3.43		2040.91					301.31
	300		0.00	0.01	0.03	0.285	0.000					2043.17				-1.74	307.33
	301		0.00	0.00	0.03	0.273	0.000		-0.027			2043.94				-2.01	314.81
	302 303		0.00	0.00 -0.01	0.03 0.04	0.273 0.261	0.000 0.000		-0.027 -0.034	-3.50		2045.86 2046.62				-1.85 -2.10	321.17 328.83
	304			-0.01	0.04	0.250	0.000		-0.034			2048.46				-2.10 -1.99	335.29
207	305			-0.02	0.04	0.238	0.000	0.049	-0.032	-4.21		2049.03				-2.33	343.01
208	306	0.21	0.00	-0.03	0.04	0.226	0.000	0.059	-0.030	-4.21	-2.54	2050.72	342.43			-2.20	349.63
	307			-0.03	0.04	0.226	0.000		-0.030			2051.18				-2.57	357.46
	308			-0.03	0.04	0.226	0.000		-0.030			2052.72				-2.45	364.23
	309 310			-0.03 -0.03	0.04 0.04	0.215 0.215	0.000		-0.031 -0.031			2052.94 2054.26				-2.70 -2.50	372.31 379.31
	311			-0.02	0.04	0.215	0.000		-0.034			2054.33					387.54
	312			-0.02	0.04	0.216	0.000		-0.034 -0.034			2055.52				-2.74 -2.55	394.67
215	313			-0.01	0.04	0.216	0.000		-0.036			2055.55				-2.87	402.95
	314		0.00	0.00	0.04	0.228	0.000		-0.038			2056.71				-2.76	410.14
217	315	0.21	0.00	0.00	0.04	0.228	0.000		-0.038	-4.78	-3.52	2056.69	409.11			-3.16	418.48
	316		0.00	0.01	0.04	0.229	0.000		-0.041			2057.80				-3.12	425.73
	317 318		0.00	0.01	0.04 0.04	0.229 0.229	0.000		-0.041 -0.041			2057.61				-3.46	434.26
	319		0.00	0.01 0.02	0.04	0.229	0.000 0.000	-0.001				2058.48 2058.06				-3.32 -3.53	441.74 450.53
	320		0.00	0.02	0.03	0.218		-0.004				2058.45				-3.25	458.29
223	321	0.20	0.00	0.02	0.03	0.218	0.000	-0.004	-0.033	-4.72	-3.64	2057.83	456.39			-3.40	467.26
	322		0.00	0.03	0.02	0.207		-0.019				2058.13				-3.06	
	323	0.18	0.00	0.03	0.01	0.196		-0.022				2057.29				-3.21	484.31
	324		0.00	0.03	0.01	0.196		-0.022				2057.68				-2.98	492.28
227	325	0.18	0.00	0.04	0.01	0.197	0.000	-0.034	-0.017	-4.28	-3.20	2056.88	489.63			-3.13	501.50
	= 99 (
	224		0.05	0.00	0.00		-0.067	0.001	0.002			1654.14	76.38			-1.27	78.35
	225 226		0.06	0.00 -0.01	0.00		-0.081 -0.095	0.002 0.014		-2.74 -2.42		1665.01	73.59 73.20			-1.42 -0.88	75.48 75.01
		-0.55				-0.548	-0.093		-0.004			1678.32	76.42			4.21	77.72
		-0.56				-0.557	0.000		-0.004			1686.96	75.85			4.20	77.03
130	229	0.25	0.00	-0.02	0.00	0.272	0.000	0.052	0.010	-0.97	0.52	1701.21	69.67			0.46	71.22
131	230	0.26	0.00	-0.02	0.01	0.283	0.000	0.055	0.000	-1.21		1709.70	69.25			0.32	70.72
	231			-0.02	0.01	0.272	0.000		-0.001	-1.18		1719.50	67.52			0.31	68.95
	232			-0.01	0.01	0.294	0.000		-0.003	-1.40		1727.80	67.29 65.83			0.05	68.64 67.14
	233			-0.01	0.02	0.294	0.000		-0.013	-1.55		1737.34	65.83			-0.01	67.14
	234 235			-0.03 -0.03	0.02 0.02	0.260 0.260	0.000 0.000		-0.008 -0.008	-2.01 -2.19		1745.36 1754.63	65.88 64.68			-0.23 -0.33	67.16 65.92
	236			-0.03 -0.04	0.02	0.237	0.000		-0.003 -0.007			1762.43	64.95			-0.63	66.15
	237			-0.04	0.02	0.237	0.000	0.072	-0.007	-2.97	-0.87	1771.55	63.90			-0.88	65.07
139	238	0.21	0.00	-0.05	0.02	0.226	0.000	0.082	-0.004	-3.65	-1.26	1779.15	64.37			-1.26	65.50
140	239	0.22	0.00	-0.04	0.03	0.237	0.000	0.073	-0.017	-3.85	-1.62	1788.10	63.49			-1.61	64.60
	240			-0.04	0.03	0.237	0.000					1795.51	64.16			-2.09	65.23
	241			-0.04	0.03	0.237	0.000		-0.017				63.68			-2.32	64.73
	242 243			-0.04 -0.04	0.03 0.04	0.237 0.237	0.000 0.000		-0.017 -0.027				64.68 64.61			-2.72 -2.79	65.71 65.65
	244			-0.04 -0.03	0.04	0.237	0.000		-0.027 -0.029			1826.05	65.90			-2.79 -3.17	66.90
	244			-0.03	0.04	0.249	0.000					1833.88	66.14			-3.17 -3.22	67.14
	246			-0.03	0.05	0.248	0.000		-0.039				67.63			-3.61	68.66
148	247	0.23	0.00	-0.02	0.04	0.249	0.000	0.051	-0.032	-5.93	-3.67	1847.93	68.23			-3.60	69.21
149	248	0.23	0.00	-0.02	0.04	0.249	0.000	0.051	-0.032	-6.35	-4.06	1854.22	70.01			-4.00	70.97
150	249	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-6.27	-4.07	1861.49	70.81			-4.00	71.78

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 99 (Es)															
	250		0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-6.63	-4.41	1867.49	72.89			-4.34	73.85
152	251	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-6.42	-4.26	1874.34	74.11	74.51	0.006	-4.17	75.09
153			0.00	0.00	0.04	0.250	0.000		-0.037	-6.28		1879.64	76.88	77.29	0.050	-4.06	77.85
154 155	253		0.00	0.01	0.03	0.251	0.000		-0.030	-5.54		1885.92	78.68	79.01	0.003	-3.60	79.62
			0.00	0.01	0.03	0.240	0.000		-0.031	-5.30		1890.94	81.72	81.99	0.004	-3.45	82.68
	255 256		0.00 0.00	0.01 0.02	0.03	0.240 0.240	0.000 0.000	-0.012	-0.031	-4.80 -4.65		1897.02 1901.95	83.71 86.85	84.09	0.011	-2.99 -3.01	84.70 87.80
158			0.00	0.02	0.02	0.240			-0.023 -0.023			1901.93	88.96			-3.61 -2.67	89.94
159			0.00	0.03	0.01	0.229			-0.016			1912.77	92.18			-2.82	93.16
160	259	0.21	0.00	0.03	0.01	0.229	0.000	-0.016	-0.016	-4.20	-2.69	1918.71	94.31			-2.69	95.32
	260		0.00	0.04	0.01	0.230			-0.018			1923.37	97.72			-2.83	98.78
162			0.00	0.05	0.00	0.230		-0.041					100.14			-2.63	101.23
163	262		0.00 0.00	0.05 0.05	0.00	0.219 0.219			-0.010 -0.010			1933.31 1938.41				-2.63 -2.09	105.05 108.07
165			0.00	0.03	0.00	0.217			-0.008			1942.29					112.28
	265	0.18	0.00	0.04	0.00	0.196			-0.007			1947.18					115.52
	266		0.00	0.03	0.01	0.174			-0.015			1951.15					119.68
	267		0.00	0.02	0.01	0.173			-0.013		-1.23	1956.10	121.49				122.85
	268		0.00	0.02	0.00	0.173			-0.003			1959.66					127.40
170			0.00	0.01	0.01	0.140						1964.48					130.73
171 172			0.00 0.00	0.01 0.02	0.01	0.129 0.129			-0.011 -0.002			1968.29 1972.97				-1.25 -1.14	135.05
173			0.00	0.02	0.00	0.129			-0.002 -0.002			1972.97					142.99
174			0.00		-0.01	0.129		-0.031	0.006	-2.29		1981.09					146.70
175	274	0.12	0.00	0.03	-0.01	0.129	0.000	-0.031	0.006	-2.54	-1.64	1984.45	149.63			-1.62	151.49
176	275	-0.11	0.00	0.01	-0.01	-0.115	0.000	-0.006	0.011	-2.03	-1.45	1988.68	153.48			-1.44	155.41
		-0.10		0.02		-0.105		-0.019	0.002	-2.48		1992.09					160.15
178 179		-0.10 -0.08		0.02		-0.105 -0.084		-0.019 -0.021		-2.39 -2.31		1996.21 1998.88				-1.83 -1.79	164.22 169.69
		-0.08 -0.07		0.02		-0.084 -0.073		-0.021 -0.021				2002.54					174.21
		-0.04		0.01		-0.042		-0.011	0.001	-2.08		2005.18					179.73
182		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-1.83		2008.81					184.27
	282	0.00		0.00	0.00		-0.013	0.000	0.000			2011.51					189.76
	283	0.00		0.00	0.00		-0.054	0.001				2014.84					194.62
	284		0.07		0.00		-0.094	0.002				2016.59					201.09
	285 286			-0.01 -0.01	0.00		-0.109 -0.123	0.015 0.016				2019.55 2021.48					206.36 212.64
188				-0.01	0.00		-0.125 -0.135	0.016	-0.003			2024.33					218.01
189				-0.03	0.01	0.249	0.000	0.061		-1.51		2026.38					224.07
190	289	0.23	0.00	-0.03	0.01	0.249	0.000	0.061	0.001	-1.48	0.14	2029.54	225.62			0.17	229.12
	290			-0.03	0.01	0.249	0.000	0.061				2031.58					235.28
192				-0.02	0.00	0.250	0.000	0.048				2034.57					240.49
193 194				-0.02 -0.02	0.01	0.249 0.249	0.000					2036.40 2039.23					246.87 252.27
	294			-0.02	0.01	0.249	0.000					2040.94					258.79
196		0.24	0.00	-0.02	0.02	0.260	0.000					2043.69					264.32
197				-0.01	0.02	0.261	0.000					2045.26					270.97
198	297	0.24	0.00	-0.01	0.02	0.261	0.000	0.039	-0.014	-2.61	-1.11	2047.74	271.99			-1.09	276.73
199			0.00	0.00	0.02	0.273	0.000					2049.28					283.42
	299		0.00	0.00	0.03	0.273	0.000					2051.81					289.26
	300		0.00	0.01	0.03	0.285	0.000					2053.23					296.08
202	301		0.00 0.00	0.01 0.01	0.03	0.285 0.273	0.000 0.000					2055.48 2056.58				-2.09 -2.39	302.10 309.25
204			0.00	0.00	0.03	0.261	0.000					2058.50					315.61
205				-0.01	0.04	0.250	0.000					2059.53					322.99
206	305	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-4.21	-2.66	2061.40	322.90			-2.37	329.40
207	306	0.22	0.00	-0.02	0.04	0.238	0.000	0.049	-0.032	-4.51	-2.93	2062.20	330.17			-2.64	336.89

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 99	(Es)															
208			0.00	-0.02	0.04	0.238	0.000	0.049	-0.032	-4.37	-2.79	2063.84	336.60			-2.49	343.53
209				-0.02	0.04	0.227	0.000		-0.033			2064.55				-2.80	351.11
210 211				-0.02 -0.02	0.04	0.227 0.227	0.000		-0.033 -0.033			2066.10 2066.61				-2.69 -2.95	357.86 365.64
211				-0.02 -0.02	0.04	0.227	0.000		-0.033 -0.034	-4.56		2067.96				-2.93 -2.76	372.61
213				-0.02	0.04	0.216	0.000	0.045	-0.034			2068.36				-3.04	380.51
214		0.21		-0.01	0.04	0.227	0.000		-0.036	-4.60		2069.57				-2.86	387.61
	314			-0.01	0.04	0.216	0.000		-0.036			2069.90				-3.19	395.59
216 217			0.00	0.00	0.04 0.04	0.228 0.228	0.000 0.000		-0.038 -0.038	-4.78 -5.14		2071.11 2071.35				-3.14 -3.51	402.71 410.79
218			0.00	0.01	0.04	0.229	0.000		-0.041	-5.11		2072.48				-3.49	418.01
219			0.00	0.01	0.04	0.229	0.000		-0.041	-5.11		2072.46				-3.49 -3.83	426.25
220	319	0.21		0.02	0.04	0.230	0.000	-0.001	-0.043	-5.40	-4.12	2073.48	423.82			-3.70	433.72
221			0.00	0.02	0.04	0.230		-0.001				2073.34				-3.94	442.20
222			0.00	0.02	0.03	0.218		-0.004				2073.73				-3.65	449.95
223 224			0.00	0.02 0.03	0.03	0.218 0.207		-0.004 -0.019		-5.14 -4.68		2073.38 2073.71				-3.81 -3.49	458.64 466.56
	324		0.00	0.03	0.02	0.207		-0.019				2073.71				-3.49	475.33
226			0.00	0.03	0.01	0.196		-0.022		-4.40		2073.52				-3.39	483.35
227			0.00	0.04	0.01	0.197		-0.034				2072.99				-3.54	492.29
228			0.00	0.04	0.00	0.196		-0.034				2073.16				-3.25	500.44
229	328	0.18	0.00	0.05	0.00	0.197	0.000	-0.046	-0.009	-4.62	-3.44	2072.50	497.44			-3.38	509.52
		(Fm)															
126 127	226		0.06 0.07	0.00	0.00	0.002	-0.081	0.002 0.014	0.002	-2.96 -2.55		1664.81 1673.22	81.07			-1.63	83.20
	228	-0.56		-0.01 0.01	-0.00	-0.557	-0.095 0.000	0.014		-2.53 -2.69		1678.31	80.74 83.72			-1.00 4.26	82.79 85.25
	229	-0.56		0.01	-0.02	-0.557	0.000		-0.004	-2.81		1687.03	83.07			4.23	84.50
130	230	0.26	0.00	-0.01	0.01	0.283	0.000	0.043	-0.003	-0.73	0.50	1701.69	76.48			0.44	78.25
131				-0.01	0.01	0.294	0.000		-0.003	-1.02		1710.30	75.94			0.24	77.63
132 133			0.00	0.00	0.01	0.306 0.306	0.000		-0.006 -0.006	-1.01 -1.30		1720.49 1728.86	73.82 73.52			0.19 -0.07	75.44 75.07
134			0.00	0.00	0.01	0.306	0.000		-0.006	-1.49		1728.80	71.65			-0.07 -0.14	73.07
135	235		0.00	0.00	0.02	0.306	0.000	0.037	-0.016	-1.81	-0.38	1746.91	71.61			-0.45	73.06
136	236	0.26	0.00	-0.01	0.02	0.283	0.000		-0.013	-1.86	-0.32	1756.40	70.20			-0.36	71.62
137				-0.01	0.02	0.283	0.000					1764.15	70.51			-0.60	71.88
	238 239			-0.03 -0.03	0.03	0.260 0.260	0.000 0.000		-0.018 -0.018				69.15 69.60			-0.74 -1.13	70.51 70.90
140				-0.03	0.03	0.249	0.000		-0.019				68.41			-1.40	69.69
141	241	0.23	0.00	-0.03	0.03	0.249	0.000	0.062	-0.019	-3.88	-1.91	1797.95	69.01			-1.91	70.24
142				-0.04	0.03	0.237	0.000		-0.017				68.17			-2.12	69.40
143	243 244			-0.04 -0.03	0.04 0.04	0.237 0.249	0.000 0.000		-0.027 -0.029			1813.99 1822.51	69.11 68.66			-2.53 -2.63	70.32 69.85
144				-0.03	0.04	0.249	0.000		-0.029 -0.029				69.88			-2.05 -3.05	71.04
	246			-0.03	0.05	0.248	0.000		-0.039				69.71	70.14	0.039	-3.09	70.90
147	247			-0.02	0.04	0.249	0.000					1844.15	71.23			-3.51	72.35
148				-0.02	0.04	0.249	0.000					1852.06	71.39	71.91	0.012	-3.53	72.51
149 150	249 250			-0.01 -0.01	0.04 0.04	0.250 0.250	0.000		-0.035 -0.035			1858.42	73.10 73.50	74.07	0.012	-3.96 -4.00	74.20 74.60
151			0.00	0.00	0.04	0.250	0.000		-0.033 -0.037				75.49	75.99	0.012	-4.41	76.57
	251		0.00	0.00	0.04	0.250	0.000		-0.037 -0.037			1879.42	76.32	76.82	0.008	-4.41 -4.26	77.41
153			0.00	0.01	0.04	0.251	0.000		-0.040				79.05	79.35	0.004	-4.16	80.14
	254		0.00	0.01	0.04	0.251	0.000		-0.040				80.38	80.90	0.003	-3.76	81.49
	255		0.00	0.02	0.03	0.252	0.000		-0.033				83.41	83.80	0.005	-3.64	84.48
156 157			0.00	0.02	0.03	0.240 0.241		-0.000 -0.013					85.05 88.14	85.49 88.59	0.007 0.006	-3.18 -3.21	86.14 89.20
157			0.00	0.03	0.02	0.241		-0.013					89.84	00.37	0.000	-3.21 -2.93	90.93
	259		0.00	0.03	0.02	0.230		-0.015					92.99			-3.09	94.09

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 100) (Fm)															
	260	` /	0.00	0.04	0.01	0.230	0.000	-0.028	-0.018	-4.69	-3.03	1925.56	94.75			-3.00	95.86
	261		0.00	0.04	0.01	0.230		-0.028				1930.25	98.12			-3.17	99.25
	262		0.00	0.05	0.01	0.231		-0.040				1936.34				-3.04	101.30
	263 264		0.00	0.05 0.05	0.00	0.219 0.219		-0.043 -0.043				1940.64 1946.08				-3.04 -2.50	105.08 107.75
	265		0.00	0.05	0.00	0.208						1949.98				-2.29	111.96
	266		0.00	0.03	0.00	0.196			-0.007			1955.16				-1.73	114.89
	267	0.16	0.00	0.03	0.01	0.174	0.000	-0.024	-0.015	-2.95		1959.10				-1.77	119.06
	268		0.00	0.03	0.01	0.174			-0.015			1964.37				-1.49	121.92
	269		0.00	0.03	0.00	0.174						1967.97				-1.41	126.42
	270 271		0.00	0.02	0.01	0.151 0.140		-0.015 -0.017				1973.10 1976.92				-1.19 -1.53	129.43 133.73
	272		0.00	0.02	0.00	0.140			-0.003 -0.002			1970.92				-1.33	136.84
	273		0.00	0.02	0.00	0.129		-0.018				1985.61				-1.78	141.31
174	274	0.12	0.00	0.03	-0.01	0.129	0.000	-0.031	0.006	-2.56	-1.65	1990.41	142.89			-1.63	144.67
	275		0.00		-0.01	0.130		-0.043	0.005			1993.78					149.47
		-0.10		0.01		-0.105		-0.007	0.011			1998.24				-1.61	153.13
		-0.10 -0.10		0.02		-0.105 -0.105		-0.019 -0.019	0.002 0.012			2001.65 2006.09					157.86 161.60
		-0.08		0.02		-0.084		-0.021	0.002			2008.80				-1.95	167.03
180	280	-0.07	0.00	0.02	0.00	-0.073	0.000	-0.021	0.002	-2.13	-1.59	2012.78	168.95			-1.58	171.22
	281			0.01				-0.011	0.001			2015.48					176.68
	282		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2019.40				-1.47	180.92
	283		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-2.33		2022.09				-1.77	186.40
	284		0.02	0.00	0.00		-0.027	0.000	0.000			2025.74				-1.42	190.94
	285 286		0.06 0.07	0.00	0.00		-0.081 -0.094	0.002	0.002	-2.07 -1.68		2027.44 2030.66				-0.86 -0.25	197.46 202.44
	287		0.07		0.00		-0.034 -0.123	0.002	0.005	-2.11		2032.57				-0.23 -0.07	208.76
188	288	0.03	0.09	-0.01	0.00	0.035		0.016	0.006	-1.57		2035.73				0.42	213.80
189	289	0.23	0.00	-0.03	0.01	0.249	0.000	0.061	0.001	-1.29	0.27	2037.68	216.70			0.29	219.98
	290			-0.02	0.00	0.250	0.000	0.048	0.008	-1.10		2041.19					224.65
	291 292			-0.02 -0.02	0.00	0.250 0.250	0.000 0.000	0.048 0.048	0.008 0.008	-1.46 -1.48		2043.27 2046.59				-0.13 -0.13	230.77 235.67
	293			-0.02	0.00	0.230	0.000	0.048				2048.44					242.02
	294			-0.02	0.01	0.249	0.000					2051.51					247.18
195	295	0.24	0.00	-0.01	0.01	0.261	0.000	0.038	-0.004	-2.03	-0.64	2053.21	249.59			-0.67	253.67
	296			-0.01	0.01	0.261	0.000					2056.20					258.91
	297			-0.01	0.02	0.261	0.000					2057.84					265.54
	298 299		0.00	0.00	0.02	0.273 0.273	0.000 0.000					2060.74 2062.27					270.88 277.58
	300		0.00	0.01	0.03	0.285	0.000					2065.18					283.03
	301		0.00	0.01	0.03	0.285	0.000					2066.68					289.77
202	302	0.26	0.00	0.01	0.03	0.285	0.000					2069.22				-2.19	295.49
	303		0.00	0.01	0.03	0.273	0.000					2070.37					302.59
	304		0.00	0.01	0.03	0.273	0.000					2072.61					308.61
	305 306		0.00	$0.00 \\ -0.01$	0.04 0.04	0.262 0.250	0.000 0.000					2073.47 2075.64					316.16 322.26
	306			-0.01 -0.01	0.04	0.230	0.000					2075.64					322.26
	308			-0.01	0.04	0.238	0.000					2078.33					336.12
	309			-0.02	0.04	0.227	0.000					2078.94					343.79
	310			-0.02	0.04	0.227	0.000					2080.77					350.26
	311			-0.02	0.04	0.227	0.000					2081.28					358.03
	312 313			-0.01 -0.01	0.04 0.04	0.227	0.000 0.000					2082.94 2083.36					364.67 372.54
	314			-0.01 -0.01	0.04	0.227 0.216	0.000					2083.30					379.32
	315		0.00	0.00	0.04	0.228	0.000					2085.29					387.23
	316		0.00	0.00	0.04	0.228	0.000					2085.29					394.07

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 100	(Fm)															
	317	0.21	0.00	0.01	0.04	0.229	0.000	0.011	-0.041	-5.17	-3.92	2087.12	393.26			-3.56	402.05
	318		0.00	0.01	0.04	0.229			-0.041			2088.50				-3.52	
	319 320	0.21 0.21		0.01	0.04	0.229	0.000			-5.47 -5.47		2088.58 2089.82				-3.86 -3.78	417.24 424.37
	321		0.00	0.02	0.04							2089.82				-3.78 -4.03	432.82
	322	0.20		0.03	0.03							2090.44				-3.77	440.26
	323		0.00	0.03	0.03			-0.016		-5.43		2090.14				-3.97	448.90
	324		0.00	0.03	0.02							2090.70				-3.65	456.53
	325 326		0.00	0.03	0.02				-0.025			2090.28				-3.85	465.29
		0.18		0.04	0.01				-0.017			2090.84				-3.56	473.03
	327 328		0.00	0.04	0.01				-0.017 -0.007			2090.32 2090.75				-3.77 -3.47	481.90 489.78
	329	0.18		0.05	0.00				-0.009			2090.12				-3.64	498.82
230	330	0.18	0.00	0.05	0.00	0.197	0.000	-0.046	-0.009	-4.48	-3.32	2090.41	494.89			-3.25	506.91
231	331	0.18	0.00	0.06	-0.01	0.197	0.000	-0.059	-0.002	-4.92	-3.47	2089.59	503.78			-3.34	516.15
\boldsymbol{z}	= 101	(Md)															
		-0.56				-0.557			-0.004			1676.17	93.14			3.86	94.83
		-0.57				-0.566			-0.005			1685.20	92.18			3.89	93.74
	231 232	0.27 0.27		0.00	0.01	0.295 0.295			-0.006 -0.006			1699.83 1708.83	85.63 84.69			0.26 0.05	87.60 86.58
	233	0.27		0.00	0.01	0.293						1719.10	82.50			-0.03	84.32
	234		0.00	0.01	0.01	0.307						1727.84	81.83			-0.28	83.57
	235		0.00	0.01	0.02		0.000		-0.019			1737.83	79.91			-0.36	81.61
	236	0.28	0.00	0.01	0.02	0.307			-0.019			1746.35	79.47			-0.69	81.10
	237		0.00	0.00	0.02	0.295			-0.016			1755.81	78.07			-0.55	79.67
	238			-0.01	0.03	0.283			-0.023	-2.42		1763.94	78.02			-0.75	79.57
	239 240			-0.01 -0.02	0.03	0.283 0.260			-0.023 -0.021			1773.32 1781.26	76.71 76.83			-0.83 -1.14	78.23 78.31
140				-0.02 -0.03	0.03	0.249			-0.021 -0.019			1790.58	75.59			-1.14	77.04
	242			-0.03	0.03	0.237			-0.020				75.84			-1.91	77.24
142	243	0.22	0.00	-0.03	0.03	0.237	0.000	0.060	-0.020	-4.03	-2.18	1807.40	74.92			-2.18	76.29
143	244			-0.03	0.03		0.000		-0.020			1814.86	75.52			-2.58	76.85
	245			-0.03	0.04	0.237			-0.030				75.03			-2.66	76.37
	246 247			-0.02 -0.02	0.04	0.249 0.249			-0.032 -0.032				75.88 75.67			-3.08 -3.18	77.18 76.95
	248			-0.02	0.04	0.249			-0.032 -0.032				76.76			-3.16	78.01
	249			-0.01	0.04	0.250			-0.035				76.85			-3.68	78.09
	250			-0.01	0.04	0.250			-0.035				78.16			-4.14	79.38
150	251	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-6.36	-4.30	1868.42	78.46			-4.24	79.68
	252		0.00	0.00	0.04		0.000		-0.037				80.08			-4.65	81.28
	253		0.00	0.01	0.04	0.251			-0.040				80.83			-4.56	82.04
	254 255	0.23		0.01 0.02	0.04 0.03	0.251 0.252	0.000		-0.040 -0.033				83.18 84.46	84.84	0.007	-4.49 -4.15	84.37 85.63
	256	0.23		0.02	0.03				-0.033				87.06	87.61	0.007	-4.13 -4.06	88.22
	257	0.22		0.02	0.03				-0.033				88.62	89.00	0.003	-3.65	89.80
157	258	0.22	0.00	0.03	0.02	0.241	0.000	-0.013	-0.026	-5.44	-3.74	1912.07	91.31	91.69	0.005	-3.73	92.46
	259	0.22		0.03	0.02				-0.026				92.97			-3.45	94.14
	260	0.21		0.04	0.01				-0.018				95.75			-3.67	96.91
	261 262	0.21 0.21		0.04	0.01				-0.018			1930.10 1935.24	97.50			-3.54 -3.78	98.68 101.64
	263		0.00	0.05	0.01							1935.24				-3.78 -3.65	101.64
	264	0.21		0.06	0.00							1946.01				-3.66	107.07
	265	0.21		0.05	0.00							1940.01				-3.00	107.07
	266	0.19		0.05	0.00							1955.65					113.63
	267		0.00	0.04	0.00							1960.80					116.58
	268		0.00	0.04	0.01							1965.01					120.50
168	269	0.16	0.00	0.03	0.01	0.174	0.000	-0.024	-0.015	-3.03	-1.92	1970.27	121.89			-1.91	123.35

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 101	(Md)															
	270	` /	0.00	0.03	0.01	0.174	0.000	-0.024	-0.015	-3.04	-1.82	1974.20	126.04			-1.80	127.53
170	271	0.14	0.00	0.02	0.01	0.151	0.000	-0.015	-0.013	-2.49	-1.54	1979.28	129.03			-1.53	130.57
	272		0.00	0.02	0.00	0.140			-0.003			1983.42					134.54
172			0.00	0.02	0.00	0.129			-0.002			1988.44					137.65
	274		0.00	0.02	0.00	0.129			-0.002	-2.87		1992.44				-2.08	141.78
	275		0.00		-0.01	0.129		-0.031 -0.043	0.006	-2.86		1997.27				-1.93	145.12
175 176		0.12	0.00		-0.01 -0.02	0.130 0.130		-0.043 -0.043	0.005 0.014	-3.29 -2.96		2000.95 2005.36				-2.16 -1.77	149.59 153.36
	278	-0.12		0.02		-0.105		-0.019		-2.78		2009.03				-2.25	157.77
178	279	-0.10		0.02	-0.01	-0.105	0.000	-0.019	0.012	-2.67		2013.47				-2.11	161.50
179	280	-0.08	0.00	0.02	0.00	-0.084	0.000	-0.021	0.002	-2.59	-2.07	2016.48	164.47			-2.07	166.62
180	281	-0.07	0.00	0.02	0.00	-0.073	0.000	-0.021	0.002	-2.21	-1.67	2020.46	168.56			-1.67	170.81
	282			0.01	0.00	-0.042		-0.011	0.001	-2.33		2023.45				-1.77	175.97
	283	0.00		0.00	0.00		-0.040	0.000	0.001	-2.18		2027.36					180.23
	284	0.01		0.00	0.00		-0.040	0.000	0.001	-2.50		2030.37				-1.79	185.39
	285 286		0.04	0.00	0.00 0.00		-0.054 -0.094	0.001 0.002	0.001 0.003	-2.28 -2.43		2034.05 2036.15				-1.45 -0.98	189.89 196.00
	287		0.07	0.00	0.00		-0.094 -0.108	0.002	0.003	-2.43 -2.10		2030.13				-0.98 -0.38	200.95
	288			-0.01	0.00		-0.122	0.015	0.006	-2.24		2041.65					
188	289	0.03	0.10	-0.01	0.01	0.036	-0.135	0.016	-0.003	-2.02	0.20	2044.78	208.81				211.99
189	290	0.23	0.00	-0.02	0.01	0.249	0.000	0.048	-0.002	-1.23	0.12	2047.07	214.60			0.11	217.78
190	291	0.23	0.00	-0.02	0.00	0.250	0.000	0.048	0.008	-1.31		2050.66				0.00	222.38
	292			-0.02	0.00	0.250	0.000	0.048	0.008	-1.63		2053.03				-0.34	228.20
	293			-0.01	0.00	0.250	0.000	0.035	0.005	-1.49		2056.35				-0.35	233.07
	294			-0.01	0.00	0.250	0.000	0.035		-1.83		2058.52					239.10
	295 296			-0.01 -0.01	0.01	0.250 0.261	0.000 0.000	0.036	-0.005 -0.004	-1.83 -2.23		2061.67 2063.63				-0.63 -0.90	244.18 250.42
	290		0.00	0.00	0.01	0.261	0.000		-0.004 -0.007	-2.23 -2.15		2066.62				-0.90 -0.89	255.65
	298		0.00	0.00	0.01	0.261	0.000		-0.007	-2.54		2068.66				-1.38	261.82
198	299	0.25	0.00	0.00	0.02	0.273	0.000	0.029	-0.017	-2.76	-1.36	2071.52	262.79			-1.35	267.25
199	300	0.25	0.00	0.01	0.02	0.273	0.000	0.017	-0.020	-3.20	-1.91	2073.47	268.91			-1.89	273.53
200			0.00	0.01	0.02	0.273	0.000		-0.020	-3.32		2076.26				-1.99	278.98
201			0.00	0.02	0.02	0.285	0.000		-0.023			2078.00				-2.48	285.48
	303 304		0.00 0.00	0.02 0.01	0.03	0.285 0.273	0.000 0.000		-0.033 -0.030								291.17 297.98
	305																
	306	0.24	0.00	0.01	0.03	0.262 0.262	0.000 0.000		-0.030 -0.030								304.02 311.07
	307		0.00	0.00	0.03	0.250	0.000		-0.027								317.34
207	308			-0.01	0.04	0.238	0.000	0.037	-0.035	-4.51	-3.08	2088.62	318.33				324.63
208	309	0.22	0.00	-0.01	0.04	0.238	0.000	0.037	-0.035	-4.37	-2.97	2090.59	324.42			-2.68	330.93
209	310	0.21	0.00	-0.02	0.04	0.227	0.000	0.047	-0.033	-4.64	-3.20	2091.51	331.58			-2.91	338.29
210				-0.01	0.04	0.227	0.000		-0.036								344.77
	312			-0.01	0.04	0.227	0.000		-0.036								352.25
	313 314			-0.01 -0.01	0.04	0.227 0.216	0.000 0.000		-0.036 -0.036								358.86 366.44
214 215	316		0.00 0.00	0.00 0.00	0.04 0.04	0.228 0.217	0.000 0.000		-0.038 -0.038								373.14 380.76
	317		0.00	0.01	0.04	0.229	0.000		-0.041								387.55
	318		0.00	0.01	0.04	0.229	0.000		-0.041								395.24
218	319	0.21	0.00	0.02	0.04	0.230	0.000	-0.001	-0.043	-5.57	-4.26	2102.35	393.38			-3.87	402.18
219	320	0.21	0.00	0.02	0.04	0.230	0.000	-0.001	-0.043	-5.96	-4.64	2102.76	401.04			-4.25	410.08
220			0.00	0.02	0.04	0.230			-0.043								417.20
	322		0.00	0.03	0.03	0.230			-0.035								425.34
222	323 324		0.00 0.00	0.03	0.03	0.219 0.219			-0.035 -0.035							-4.22 -4.41	432.75 441.10
	325 326		0.00 0.00	0.03	0.02	0.219 0.208			-0.025 -0.027								448.74 457.23
	520	0.19	0.00	0.04	0.02	0.200	0.000	-0.031	-0.027	-5.0 4	-+.+3	2105.55	11 0.07			— → .∠/	T31.43

		ε_2	ϵ_3	\mathcal{E}_4	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p} (MeV)	$E_{ m mic}$ (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	$M_{\rm exp}$ (MeV)	σ_{exp} (MeV)	$E_{\rm mic}^{\rm FL}$ (MeV)	$M_{\rm th}^{\rm FL}$ (MeV)
Z = '	101	(Md)															
226 3			0.00	0.04	0.01	0.197	0.000	-0.034	-0.017	-5.18	-4.03	2105.85	454.45			-3.97	464.97
227 3	328	0.18	0.00	0.04	0.01	0.197	0.000	-0.034	-0.017	-5.36	-4.24	2105.60	462.78			-4.18	473.56
228 3		0.18		0.04	0.00			-0.034		-4.93		2106.03				-3.88	481.43
229 3		0.18		0.05	0.00					-5.31		2105.68				-4.05	490.19
230 3		0.18		0.05	-0.01			-0.047	0.000	-4.89		2105.86				-3.56	498.37
231 3		0.18			-0.01				-0.002			2105.40				-3.73	507.25
232 3:233 3:		0.17	0.00		-0.01 -0.02			-0.061 -0.074		-4.97		2105.60 2105.04				-3.36	515.44 524.49
			0.00	0.07	-0.02	0.160	0.000	-0.074	0.007	-3.40	-3.73	2103.04	311.70			-3.40	324.43
Z = 1		` '	0.00	0.01	0.02	0.566	0.000	0.107	0.005	2.52	4 72	1605 11	07.62			4.21	00.44
130 2		-0.57 0.28		0.01	-0.02 0.00	-0.566 0.307		0.107	-0.005 0.001	-2.52 -0.64		1695.11 1708.33	97.63 92.49			4.21 0.23	99.44 94.61
131 2		0.28		0.01	0.00	0.307			-0.001	-0.04 -0.77		1708.33	89.91			0.23	91.97
133 2		0.28		0.01	0.01	0.307			-0.009	-1.07		1727.76	89.20			-0.08	91.18
134 2	236	0.29		0.02	0.01	0.319	0.000	0.014	-0.013	-1.21	-0.08	1738.13	86.90			-0.17	88.82
135 2	237	0.28	0.00	0.01	0.02	0.307	0.000	0.025	-0.019	-1.60	-0.35	1746.64	86.46			-0.44	88.32
136 2	238	0.28	0.00	0.01	0.02	0.307	0.000	0.025	-0.019	-1.62	-0.38	1756.64	84.54			-0.46	86.35
137 2		0.28	0.00	0.01	0.02	0.307			-0.019	-1.87		1764.72	84.52			-0.60	86.27
138 2		0.26		0.00	0.02	0.284			-0.016				82.89			-0.61	84.61
139 2				-0.01	0.03	0.272			-0.024			1782.38	83.01			-0.89	84.69
140 2				-0.02	0.03	0.249			-0.022				81.42			-1.15	83.07
141 2				-0.02	0.03	0.249			-0.022	-3.24		1799.88	81.65			-1.61	83.25
142 2143 2				-0.03 -0.03	0.03	0.237 0.237			-0.020 -0.020	-3.60 -4.06		1809.23	80.37 80.94			-1.86 -2.25	81.94 82.47
143 2				-0.03 -0.02	0.03	0.237			-0.020 -0.032			1825.69	80.06			-2.23 -2.36	81.58
145 2				-0.02	0.04	0.249			-0.032			1832.95	80.87			-2.78	82.34
146 2				-0.02	0.04	0.249			-0.032	-4.92		1841.60	80.29			-2.78	81.74
147 2				-0.01	0.04	0.250			-0.035	-5.32		1848.62	81.34			-3.33	82.75
148 2	250	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-5.44	-3.48	1857.01	81.02			-3.43	82.43
149 2	251	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-5.93	-3.96	1863.82	82.28			-3.92	83.65
150 2	252	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-6.10	-4.12	1871.99	82.18	82.88	0.013	-4.06	83.55
151 2		0.23		0.01	0.04	0.251			-0.040	-6.61		1878.51	83.74			-4.50	85.09
152 2		0.23		0.01	0.04	0.251			-0.040	-6.55		1886.23	84.09	84.72	0.018	-4.45	85.44
153 2		0.23		0.02	0.03	0.252			-0.033			1891.98	86.40	86.85	0.010	-4.41	87.70
154 2			0.00	0.02	0.03	0.252			-0.033				87.27	87.82		-4.09	88.57
155 2		0.22		0.02	0.03				-0.033				89.81	90.24	0.022	-4.03	91.10
156 2 157 2		0.22		0.03	0.02				-0.026 -0.026				91.01 93.60			-3.66 -3.78	92.28 94.87
158 2		0.22		0.03	0.02				-0.028				94.85			-3.56	96.15
159 2		0.21		0.04	0.01				-0.018				97.59			-3.79	98.86
160 2	262	0.21	0.00	0.05	0.01	0.231	0.000	-0.040	-0.021	-5.71	-3.79	1936.02	98.87			-3.77	100.18
161 2		0.21		0.05	0.01							1941.19				-4.04	103.08
162 2	264	0.21	0.00	0.06	0.00	0.231	0.000	-0.053	-0.013	-6.15	-4.00	1947.70	103.33			-3.97	104.68
163 2		0.20		0.06	0.00							1952.44					108.03
164 2	266	0.20	0.00	0.06	0.00	0.220	0.000	-0.055	-0.013	-5.60	-3.54	1958.26	108.91			-3.50	110.31
165 2		0.19		0.06	0.00							1962.46				-3.23	114.21
166 2		0.18		0.05	0.00							1968.05					116.72
167 2		0.17		0.04	0.00							1972.18					120.67
168 2° 169 2°		0.16 0.16		0.04	0.00 0.00							1977.77 1981.74				-2.27 -2.18	123.20 127.34
170 2		0.10		0.04	0.00							1987.13				-2.16 -1.89	130.06
170 2		0.14		0.03	0.00							1987.13				-1.89 -2.20	134.01
171 2		0.13		0.03	0.00							1996.64				-2.20 -2.05	136.80
173 2		0.12		0.03	0.00							2000.67					140.89
174 2	276	0.12		0.04	-0.01	0.130	0.000	-0.043	0.005	-3.41	-2.30	2005.81	142.07			-2.26	143.91
175 2	277	0.12	0.00	0.04	-0.01	0.130	0.000	-0.043	0.005	-3.68	-2.57	2009.55	146.41			-2.53	148.31
176 2	278	0.12	0.00	0.04	-0.02	0.130	0.000	-0.043	0.014	-3.33	-2.20	2014.26	149.76			-2.13	151.76
177 2	279	-0.10	0.00	0.02	-0.01	-0.105	0.000	-0.019	0.012	-3.07	-2.51	2017.85	154.25			-2.49	156.27

N	A	$arepsilon_2$	ε_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 102	2 (No)															
		-0.10	0.00	0.02	-0.01	-0.105	0.000	-0.019	0.012	-2.91	-2.36	2022.59	157.58			-2.34	159.67
179		-0.08		0.02	0.00	-0.084		-0.021	0.002			2025.66				-2.33	164.74
		-0.05		0.01		-0.053		-0.011	0.001			2029.87				-1.85	168.67
		-0.04		0.01		-0.042		-0.011	0.001			2033.01				-2.09	173.69
	284	0.00		0.00	0.00	0.000	0.000	0.000	0.000			2037.22				-1.79	177.64
	285 286	0.00	0.00	0.00	0.00	0.000	0.000 -0.040	0.000 0.000	0.000	-2.62 -2.39		2040.23 2044.19				-2.07 -1.69	182.79 187.00
	287		0.06	0.00	0.00		-0.040 -0.081	0.002	0.001	-2.39 -2.38		2046.25				-1.09	193.14
	288		0.07	0.00	0.00		-0.094	0.002	0.003	-1.99		2049.79				-0.55	197.79
187	289	0.02	0.09	-0.01	0.00	0.025	-0.122	0.015	0.006	-2.33	-0.32	2051.89	200.92			-0.24	203.90
	290			-0.01	0.01		-0.122	0.015	-0.004	-1.71		2055.39				0.25	208.60
189				-0.01	0.01		-0.135	0.016		-2.05		2057.61				0.26	214.58
	292 293			-0.01 -0.01	0.00	0.250 0.250	0.000 0.000	0.035 0.035	0.005 0.005	-0.91 -1.23		2061.38 2063.75				0.16 -0.17	218.88 224.69
	294			-0.01	0.00	0.250	0.000	0.035	0.005	-1.23 -1.28		2067.43				-0.17 -0.21	229.22
	295			-0.01	0.00	0.250	0.000	0.035	0.005			2069.61				-0.51	235.23
	296			-0.01	0.00	0.250	0.000	0.035	0.005	-1.61		2073.02				-0.45	240.03
195	297	0.24	0.00	0.00	0.01	0.261	0.000	0.026	-0.007	-1.91	-0.74	2075.05	242.34			-0.77	246.20
	298		0.00	0.00	0.01	0.261	0.000		-0.007			2078.41					251.06
	299		0.00	0.00	0.01	0.261	0.000					2080.34				-1.19	257.34
	300	0.25		0.01	0.02	0.273	0.000					2083.66				-1.31	262.30
	301 302		0.00	0.01 0.02	0.02	0.273 0.285	0.000 0.000		-0.020 -0.023			2085.53 2088.67				-1.77 -1.91	268.65 273.75
	303		0.00	0.02	0.02	0.285	0.000		-0.023 -0.023			2090.40				-1.91 -2.39	280.25
	304		0.00	0.02	0.03	0.285	0.000		-0.033			2093.37				-2.41	285.64
203	305	0.25	0.00	0.02	0.03	0.274	0.000	0.006	-0.033	-4.26	-2.86	2094.78	287.17			-2.70	292.46
204	306		0.00	0.02	0.03	0.274	0.000	0.006	-0.033			2097.32				-2.55	298.18
	307		0.00	0.01	0.03	0.262	0.000		-0.030			2098.48				-2.77	305.24
	308		0.00	0.01	0.03	0.262	0.000		-0.030			2100.75				-2.49	311.24
	309	0.23		0.01	0.03	0.251	0.000		-0.030			2101.71				-2.64	318.52
	310 311	0.22	0.00	0.00	0.03	0.239 0.239	0.000 0.000		-0.028 -0.028			2103.97 2104.83				-2.51 -2.69	324.53 331.92
	312			-0.00	0.03	0.239	0.000					2107.11					338.07
	313			-0.01	0.04	0.227	0.000					2107.92					345.53
212	314	0.21	0.00	0.00	0.03	0.228	0.000	0.022	-0.028	-4.08	-2.88	2109.77	344.82			-2.72	351.81
213	315	0.20	0.00	0.00	0.03	0.217	0.000	0.020	-0.028	-4.37	-3.19	2110.51	352.16				359.36
	316		0.00	0.01	0.03	0.228	0.000					2112.46					365.71
	317		0.00	0.01 0.01	0.03	0.228	0.000					2113.11					373.34 379.76
	318 319		0.00	0.01	0.03	0.217 0.217	0.000					2115.00 2115.59					387.46
	320		0.00	0.02	0.03	0.229						2117.29					394.09
219			0.00	0.02	0.03	0.218						2117.72					401.97
	322		0.00	0.03	0.03	0.230						2119.23				-4.16	408.81
	323	0.20	0.00	0.03	0.03	0.219						2119.50					416.86
222	324		0.00	0.03	0.03	0.219	0.000	-0.016	-0.035	-5.77	-4.56	2120.71	414.60			-4.30	423.97
	325		0.00	0.04	0.02	0.219						2120.60					432.29
	326		0.00	0.04	0.02	0.208						2121.64					439.60 448.00
	327 328		0.00	0.04 0.04	0.01	0.208 0.197						2121.46 2122.38					448.00
	329		0.00	0.04	0.01	0.197						2122.11					464.02
	330	0.18	0.00	0.05	0.00	0.197						2122.90				-4.16	471.58
229			0.00	0.05	0.00	0.197						2122.38					480.45
	332		0.00	0.06	0.00	0.198						2123.02					488.23
	333		0.00		-0.01	0.197						2122.52					497.07
	334		0.00		-0.01	0.198						2123.06					504.98
	335		0.00		-0.01	0.187						2122.39					514.01
234	336	0.09	0.00	-0.02	0.01	0.096	0.000	0.028	-0.008	-4.03	-5.4/	2122.53	JUY.64			-5.43	522.07

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ε_6	eta_2	eta_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 102	(No)															
	337		0.00	-0.01	0.01	0.107	0.000	0.017	-0.009	-4.33	-3.81	2121.96	518.28			-3.80	530.98
236	338	0.10	0.00	-0.01	0.02	0.107	0.000	0.017	-0.019	-4.25	-3.72	2122.45	525.86			-3.61	538.96
\boldsymbol{z}	= 103	(Lr)															
	235	` '	0.00	0.02	0.01	0.308	0.000	0.011	-0.013	-0.87	0.12	1716.75	99.43			-0.01	101.72
	236		0.00	0.02	0.01	0.308	0.000		-0.013	-1.17		1725.92	98.33			-0.27	100.53
	237		0.00	0.02	0.01	0.308	0.000	0.011	-0.013	-1.29	-0.25	1736.34	95.98			-0.36	98.13
	238			0.02	0.01	0.308	0.000		-0.013	-1.57		1745.20	95.19			-0.62	97.25
136	239	0.28	0.00	0.02	0.02	0.308	0.000	0.013	-0.023	-1.74	-0.54	1755.25	93.22			-0.64	95.24
	240		0.00	0.02	0.02	0.308	0.000		-0.023	-1.99		1763.72	92.81			-0.80	94.75
138			0.00	0.01	0.02	0.284	0.000		-0.020	-1.95		1773.41	91.19			-0.75	93.11
	242 243		0.00	0.00 -0.01	0.02	0.273 0.250	0.000 0.000	0.029	-0.017 -0.015	-2.26 -2.48		1781.72 1791.31	90.96 89.43			-1.02 -1.18	92.82 91.26
	243			-0.01 -0.02	0.02	0.230	0.000			-2.46 -3.20		1791.31	89.43			-1.18 -1.58	91.20
	245			-0.02	0.03	0.238	0.000		-0.022	-3.41		1808.96	87.93			-1.92	89.68
143		0.22			0.03	0.238	0.000	0.048	-0.022 -0.022	-3.41 -3.86		1816.82	88.14			-1.92 -2.30	89.84
	247			-0.01	0.03	0.250	0.000		-0.025	-3.96		1825.82	87.22			-2.45	88.88
	248			-0.01	0.03	0.250	0.000		-0.025	-4.41		1833.43	87.68			-2.85	89.29
146	249	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-4.86	-3.01	1842.18	86.99			-3.00	88.61
147	250	0.23	0.00	-0.01	0.04	0.250	0.000	0.039	-0.035	-5.36	-3.46	1849.58	87.67			-3.45	89.24
148	251	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-5.53	-3.64	1858.06	87.25			-3.61	88.81
	252	0.23	0.00	0.00	0.04	0.250	0.000	0.027	-0.037	-6.06	-4.14	1865.26	88.13			-4.12	89.65
	253		0.00	0.01	0.04	0.251	0.000		-0.040	-6.33		1873.52	87.95			-4.32	89.46
151	254	0.23	0.00	0.01	0.04	0.251	0.000	0.015	-0.040	-6.82	-4.81	1880.40	89.13			-4.77	90.62
	255	0.23		0.02	0.04	0.252	0.000		-0.043	-6.92		1888.22	89.39			-4.78	90.88
	256		0.00	0.02	0.03	0.252	0.000		-0.033	-6.59		1894.36	91.32			-4.78	92.74
	257 258		0.00	0.03	0.03	0.252 0.241	0.000		-0.036 -0.036	-6.45		1901.66 1907.57	92.09			-4.51	93.53 95.67
	259		0.00	0.03	0.03	0.241		-0.012 -0.013		-6.39 -5.79		1907.57	94.25 95.38			-4.48 -4.15	95.67 96.78
157			0.00	0.03	0.02	0.242		-0.025		-6.13		1920.39	97.57			-4.32	98.96
157			0.00	0.04	0.02	0.242		-0.023 -0.027		-5.90		1920.39	98.76			-4.32 -4.13	100.17
	262		0.00	0.05	0.02	0.231		-0.040		-6.31		1932.99	101.12			-4.39	102.50
	263		0.00	0.05	0.01	0.231		-0.040		-6.33			102.33			-4.41	103.74
161	264	0.21	0.00	0.05	0.01	0.231	0.000	-0.040	-0.021	-6.62	-4.68	1945.36	104.89			-4.68	106.30
162	265	0.21	0.00	0.06	0.00	0.231	0.000	-0.053	-0.013	-6.81	-4.66	1951.92	106.39			-4.65	107.83
163	266		0.00	0.06	0.00	0.220						1957.01					110.83
	267		0.00	0.06	0.00	0.220			-0.013			1962.86					113.08
	268		0.00	0.06	0.00	0.209						1967.38					116.65
	269	0.18		0.05	0.00	0.197						1972.94					119.18
	270		0.00	0.05	0.00	0.186						1977.39					122.83
	271		0.00	0.04	0.00	0.174						1982.96					125.36
	272273		0.00	0.04	0.00 0.00	0.174 0.163						1987.26 1992.61					129.17 131.94
	274		0.00	0.03	0.00	0.141						1997.07					135.58
	275		0.00	0.03	0.00	0.130						2002.42					138.36
	276	0.12		0.03	0.00	0.130						2006.79					142.11
	277	0.12			-0.01	0.130		-0.043				2011.94					145.10
	278	0.12			-0.01	0.130		-0.043				2016.00					149.17
176	279	0.12	0.00	0.04	-0.02	0.130	0.000	-0.043	0.014	-3.73	-2.59	2020.73	150.59			-2.53	152.61
177	280	-0.10	0.00	0.02	0.00	-0.105	0.000	-0.019	0.002	-3.27	-2.73	2024.47	154.92				156.94
		-0.10				-0.105		-0.019				2029.23					160.34
		-0.08		0.02		-0.084		-0.021				2032.64					165.06
		-0.07		0.02		-0.073		-0.021				2036.94					168.90
		-0.04		0.01		-0.042		-0.011	0.001			2040.29					173.70
		-0.03		0.01			-0.013					2044.49					177.66
	286 287	0.00	0.02	0.00	0.00		-0.027 -0.067	0.000	0.000			2047.81 2051.80					182.49 186.68
	288	0.00		0.00	0.00		-0.067 -0.094	0.001				2051.80					192.45

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	$E_{ m mic}$	$E_{\rm bind}$	$M_{ m th}$	$M_{\rm exp}$	$\sigma_{ m exp}$	$E_{ m mic}^{ m FL}$	$M_{ m th}^{ m FL}$
										(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
\boldsymbol{Z}	= 103	(Lr)															
		0.00		0.00			-0.094	0.002	0.003			2057.80				-0.80	197.04
				-0.01 -0.01			-0.122 -0.135	0.015	0.006 -0.003	-2.58 -2.30		2060.22 2063.71				-0.49 0.03	202.83 207.54
				-0.01			-0.135 -0.135	0.016	-0.003	-2.30 -2.25		2066.18				0.03	213.24
				-0.01		0.250	0.000	0.035	0.005	-0.99		2069.92				0.04	217.57
191	294	0.23	0.00	-0.01	0.00	0.250	0.000	0.035	0.005	-1.36	-0.32	2072.65	219.73			-0.35	223.01
				-0.01		0.250	0.000	0.035	0.005	-1.39		2076.29				-0.34	227.58
		0.23		0.00		0.250	0.000	0.023	0.002			2078.76				-0.64	233.28
		0.23		0.00		0.250	0.000	0.023	0.002			2082.26				-0.65	237.99
		0.23		0.00		0.250	0.000	0.023	0.002			2084.59				-0.96	243.85
		0.24		0.00		0.261	0.000		-0.007	-2.12		2087.98				-1.02	248.69
		0.24 0.24		0.01		0.262 0.262	0.000 0.000		-0.010			2090.27 2093.51				-1.46 -1.54	254.59 259.57
		0.25		0.01		0.273	0.000					2095.75				-2.01	265.60
		0.25		0.02		0.274	0.000	0.005	-0.023	-3.52	-2.23	2098.95	266.08			-2.20	270.64
201	304	0.25	0.00	0.02	0.02	0.274	0.000	0.005	-0.023	-4.00	-2.70	2100.98	272.11			-2.68	276.82
202	305	0.26	0.00	0.03	0.02	0.286	0.000	-0.004	-0.026			2103.91				-2.74	282.15
		0.25		0.02		0.274	0.000		-0.033			2105.69				-3.02	
		0.25		0.02		0.274	0.000		-0.033			2108.22					294.41
		0.24		0.01		0.262	0.000					2109.57				-2.96	301.28
		0.24 0.23		0.02		0.263	0.000		-0.033 -0.030			2112.01				-2.84	307.12
		0.23		0.01		0.251 0.251	0.000 0.000		-0.030 -0.030			2113.23 2115.44				-2.93 -2.77	314.12 320.17
		0.22		0.01		0.240	0.000		-0.030			2116.63				-2.98	327.24
		0.22		0.01		0.240	0.000					2118.73					333.41
211	314	0.21	0.00	0.00	0.03	0.228	0.000	0.022	-0.028	-4.39	-3.21	2119.81	334.00			-3.08	340.58
212	315	0.21	0.00	0.01	0.03	0.228	0.000	0.010	-0.031	-4.36	-3.19	2121.89	339.99			-3.03	346.79
		0.21		0.01		0.228	0.000		-0.031			2122.94				-3.37	354.02
		0.21 0.21		0.01		0.228 0.229	0.000 0.000					2124.88 2125.87				-3.35 -3.75	360.36 367.67
216	319	0.21	0.00	0.02		0.229	0.000	-0.002				2127.77				-3.81	374.07
		0.20		0.02		0.218		-0.004				2128.62				-4.22	381.51
		0.21		0.03		0.230						2130.35				-4.21	388.11
		0.20		0.02		0.218						2131.02					395.70
		0.21		0.03		0.230						2132.60					402.47
		0.20		0.03		0.219						2133.13					410.24
		0.20		0.03		0.219 0.219						2134.35 2134.58					417.34 425.32
		0.20		0.04		0.219						2135.62					432.62
		0.19		0.04		0.208						2135.71					440.74
226	329	0.18	0.00	0.04	0.01	0.197	0.000	-0.034	-0.017	-5.91	-4.77	2136.63	438.25			-4.70	448.16
		0.18		0.05		0.197	0.000	-0.045	-0.019	-6.34	-5.03	2136.71	446.24			-4.92	456.46
		0.18		0.05		0.197						2137.32					464.14
		0.18		0.05		0.197						2137.19					472.60
		0.18		0.06		0.198						2137.85					480.36
		0.18			-0.01							2137.61					488.93
		0.18 0.17			-0.01 -0.01							2138.16 2137.73					496.81 505.61
		0.17			-0.01							2137.73					513.71
			0.00			0.107	0.000					2137.41					522.46
236	339	0.10	0.00	0.00	0.01	0.107	0.000	0.005	-0.010	-4.44	-3.93	2137.80	517.80			-3.93	530.43
\boldsymbol{z}	= 104	(Rf)															
		0.29		0.03		0.320	0.000					1735.82					106.18
		0.29		0.03		0.320	0.000					1744.69					105.29
		0.29		0.03		0.320	0.000					1755.11					102.89
		0.28 0.26		0.02		0.308 0.284	0.000 0.000					1763.70 1773.67					102.31 100.38
	2 T2	0.20	0.00	0.01	0.02	0.204	0.000	0.020	0.020	1.55	0.72	1113.01	70.23			U.T/	100.50

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7	= 104	(Rf)															
139 140		0.25 0.23		0.00 -0.01 -0.01	0.02 0.02 0.02	0.273 0.250 0.250	0.000 0.000 0.000	0.037	-0.017 -0.015 -0.015	-2.06	-0.82	1782.00 1791.93 1800.09	97.97 96.11 96.02			-0.74 -0.86 -1.24	100.06 98.17 98.01
143	246 247	0.22	0.00	-0.01 -0.02	0.03 0.03	0.250 0.238	0.000	0.048	-0.025 -0.022	-3.39	-1.92	1809.95 1817.83	94.23 94.42			-1.57 -1.94	96.19 96.33
145		0.22 0.23 0.23	0.00 0.00 0.00 0.00 0.00	-0.01 -0.01 0.00 0.00 0.01	0.03 0.03 0.03 0.03 0.03	0.238 0.238 0.250 0.250 0.251	0.000 0.000 0.000 0.000 0.000	0.036 0.026 0.026	-0.025 -0.025 -0.027 -0.027 -0.030	-3.49 -3.94 -4.13 -4.65 -4.89	-2.48 -2.66 -3.13	1827.20 1834.85 1843.96 1851.42 1860.29	93.12 93.55 92.50 93.12 92.32			-2.09 -2.49 -2.66 -3.14 -3.34	94.99 95.37 94.29 94.86 94.03
149 150 151	253 254 255 256	0.23 0.23 0.23 0.23	0.00	0.01 0.02 0.02 0.02 0.03	0.03 0.03 0.03 0.03 0.03	0.251 0.252 0.252 0.252 0.252	0.000 0.000 0.000 0.000	0.014 0.002 0.002 0.002	-0.030 -0.033 -0.033 -0.033 -0.036	-5.44 -5.80 -6.33 -6.36	-3.85 -4.10 -4.59 -4.63	1867.52 1876.18 1883.14 1891.32 1897.60	93.16 92.57 93.68 93.57 95.37	94.24	0.024	-3.85 -4.09 -4.59 -4.61 -4.66	94.83 94.23 95.31 95.19 96.97
154 155	258 259 260	0.23 0.22 0.22	0.00	0.03 0.04 0.04 0.04	0.03 0.02 0.02 0.02	0.252 0.242 0.242 0.242	0.000 0.000 0.000	-0.010 -0.025	-0.036 -0.028 -0.028	-6.29 -6.22 -5.93	-4.44 -4.43 -4.18	1905.25 1911.22 1918.61	95.79 97.89 98.57 100.72	101.32	0.029	-4.41 -4.42 -4.16 -4.34	97.38 99.44 100.12 102.26
160	262263264265	0.21 0.21	0.00 0.00 0.00 0.00	0.05 0.05 0.06 0.06	0.01 0.01 0.01 0.00	0.231 0.231 0.232 0.231	0.000 0.000	$-0.040 \\ -0.052$	-0.021 -0.021 -0.023 -0.013	-6.42 -6.76	-4.58 -4.59	1931.79 1937.67 1944.84 1950.45	103.73 104.62			-4.20 -4.57 -4.56 -4.92	103.07 105.25 106.18 108.61
162 163 164	266267268	0.21 0.21 0.20	0.00 0.00 0.00	0.07 0.07 0.07	0.00 0.00 0.00	0.232 0.232 0.221	0.000 0.000 0.000	-0.065 -0.065 -0.067	-0.015 -0.015 -0.015	-7.39 -7.46 -6.90	-4.95 -5.02 -4.52	1957.41 1962.55 1968.75	108.19 111.13 113.00			-4.91 -4.99 -4.47	109.77 112.71 114.61
166 167	269270271272	0.18 0.17	0.00 0.00 0.00 0.00	0.06 0.06 0.05 0.05	0.00 0.00 0.00 0.00	0.209 0.198 0.186 0.175	$0.000 \\ 0.000$	$-0.058 \\ -0.048$	-0.012 -0.012 -0.009 -0.009	-5.54	-3.60 -3.45	1973.27 1979.15 1983.63 1989.54	118.74 122.33			-3.56 -3.43	118.15 120.38 123.98 126.18
170 171 172	273 274 275 276 277	0.14 0.13 0.12	0.00 0.00 0.00 0.00 0.00	0.05 0.04 0.03 0.03	0.00 0.00 0.00 0.00	0.175 0.152 0.141 0.130 0.130	0.000 0.000 0.000	-0.030	-0.006 -0.004 -0.004	-3.76	-2.68 -2.96 -2.82	1993.84 1999.59 2004.08 2009.78 2014.17	130.59 134.17 136.54			-2.66 -2.95 -2.81	129.98 132.33 135.94 138.35 142.08
174 175 176	278 279 280	0.12 0.12 0.12	0.00 0.00 0.00	0.04 0.05	0.00 -0.01 -0.02	0.130 0.130 0.130 0.130 -0.105	0.000 0.000 0.000	-0.030 -0.043 -0.043 -0.055 -0.019	0.005 0.005 0.013	-4.22 -4.46 -4.37	-3.09 -3.35 -2.97	2019.69 2023.76 2028.82	142.77 146.77 149.79			-3.06 -3.32 -2.89	144.70 148.75 151.87
178 179	282 283	-0.10 -0.09 -0.08	0.00	0.02	-0.01 0.00	-0.094 -0.084	0.000	-0.020 -0.021	0.012 0.002	-3.47 -3.49	-2.92 -2.93	2032.52 2037.62 2041.06	157.13 161.76			-2.90 -2.92	156.22 159.28 163.96
181	285 286	-0.05 -0.04 0.00 0.00	0.00	0.01 0.01 0.00 0.00		-0.053 -0.042 0.000 0.000		-0.011 -0.011 0.000 0.000	0.001 0.000	-3.28 -2.93	-2.71 -2.38	2045.67 2049.13 2053.65 2056.98	169.83 173.38			-2.71 -2.39	167.48 172.17 175.79 180.61
184 185	288	0.00	0.02 0.07 0.07	0.00 0.00 0.00	0.00 0.00 0.00	0.002	-0.027 -0.094 -0.094	0.000 0.002 0.002	0.000 0.003	-2.85 -3.12	-2.24 -1.69	2061.23 2063.57 2067.47	181.95 187.68			-2.24 -1.65	184.52 190.38 194.65
188 189	293	0.01 0.02	0.10	-0.01 -0.01	0.00 0.01 0.01	0.014 0.026	-0.108 -0.121 -0.135		-0.004 -0.003	-2.08 -2.32	-0.20 -0.10	2069.78 2073.57 2076.00	201.90 207.53			-0.11 -0.00	200.51 204.93 210.68
190 191 192 193	295 296	0.23 0.23		-0.01 -0.01 0.00 0.00	-0.01 0.00 0.00 0.00	0.239 0.250 0.250 0.250	0.000 0.000 0.000 0.000	0.032 0.035 0.023	0.005 0.002	-1.04	$-0.08 \\ -0.11$	2079.81 2082.48 2086.46	217.20 221.29			$-0.10 \\ -0.13$	214.96 220.45 224.65
194	297 298 299	0.23	0.00	0.00	0.00	0.250 0.250 0.250	0.000	0.023 0.023 0.023	0.002	-1.42	-0.43	2088.97 2092.77 2095.12	231.12			-0.46	230.31 234.71 240.55

N	A	ε_2	ϵ_3	ϵ_4	ε_6	eta_2	β_3	eta_4	eta_6	E_{s+p}	$E_{\rm mic}$	E _{bind} (MeV)	M _{th}	M _{exp}	$\sigma_{\rm exp}$	$E_{\rm mic}^{\rm FL}$	M _{th} FL
										(IVIC V)	(IVIC V)	(IVIC V)	(IVIC V)	(IVIC V)	(IVIC V)	(IVIC V)	(IVIC V)
	= 104																
196	300	0.24	0.00	0.01	0.01	0.262	0.000	0.014	-0.010	-1.88	-0.83	2098.82	241.21			-0.85	245.07
197	301	0.24	0.00	0.01	0.01	0.262	0.000	0.014	-0.010	-2.31	-1.26	2101.14	246.96			-1.29	250.94
198	302	0.25	0.00	0.02	0.01	0.274	0.000	0.004	-0.013	-2.50	-1.39	2104.72	251.45			-1.41	255.58
199	303	0.25	0.00	0.02	0.01	0.274	0.000	0.004	-0.013	-2.98	-1.85	2106.91	257.34			-1.87	261.60
200	304	0.25	0.00	0.02	0.02	0.274	0.000	0.005	-0.023	-3.33	-2.11	2110.46	261.86			-2.06	266.34
201	305	0.26	0.00	0.03								2112.54				-2.56	272.48
		0.26		0.03				-0.004				2112.34				-2.50 -2.64	277.49
									-0.026 -0.026								
		0.25		0.03								2117.43				-2.88	284.05
		0.25		0.03				-0.007				2120.25				-2.71	289.47
203	309	0.25	0.00	0.03	0.02	0.273	0.000	-0.007	-0.026	-4.19	-2.92	2121.00	291.01			-2.86	296.28
206	310	0.24	0.00	0.03	0.02	0.263	0.000	-0.009	-0.026	-3.96	-2.75	2124.32	296.42			-2.67	301.88
207	311	0.24	0.00	0.03	0.02	0.263	0.000	-0.009	-0.026	-4.13	-2.95	2125.65	303.17			-2.88	308.79
208	312	0.23	0.00	0.02	0.03	0.252	0.000	0.002	-0.033	-4.04	-2.84	2128.22	308.66			-2.67	314.56
209	313	0.23	0.00	0.02	0.03	0.252	0.000	0.002	-0.033	-4.24	-3.01	2129.38	315.58			-2.85	321.65
210	314	0.22	0.00	0.02	0.03	0.240	0.000	-0.000	-0.033	-4.09	-2.97	2131.88	321.15			-2.79	327.42
211	315	0.22	0.00	0.02	0.03	0.240	0.000	-0.000	-0.033	-4 35	-3 16	2132.91	328 19			-2.98	334.64
		0.22		0.03				-0.013				2135.16				-2.93	340.57
		0.21		0.02				-0.002				2136.25				-3.22	347.83
		0.21		0.02					-0.033							-3.26	353.81
		0.21		0.02					-0.033							-3.67	361.10
		0.21		0.03					-0.035							-3.69	367.25
		0.21		0.03					-0.035							-4.14	374.64
		0.21		0.03					-0.035							-4.17	380.92
		0.20		0.03					-0.035			2145.32				-4.56	388.51
220	324	0.20	0.00	0.03	0.03	0.219	0.000	-0.016	-0.035	-5.97	-4.76	2147.13	386.61			-4.52	395.00
		0.20		0.03	0.03	0.219	0.000	-0.016	-0.035	-6.33	-5.12	2147.67	394.14			-4.88	402.75
222	326	0.20	0.00	0.04	0.03	0.220	0.000	-0.028	-0.038	-6.35	-5.01	2149.27	400.62			-4.71	409.52
223	327	0.20	0.00	0.04	0.02	0.219	0.000	-0.029	-0.028	-6.38	-5.15	2149.47	408.49			-5.00	417.47
224	328	0.19	0.00	0.04	0.02	0.208	0.000	-0.031	-0.027	-6.11	-4.90	2150.80	415.22			-4.74	424.46
225	329	0.19	0.00	0.05	0.01	0.208	0.000	-0.044	-0.020	-6.43	-5.12	2150.96	423.14			-5.01	432.57
226	330	0.18	0.00	0.05	0.01	0.197	0.000	-0.045	-0.019	-6.20	-4.88	2152.17	430.00			-4.76	439.69
		0.18		0.05								2152.05				-4.88	448.08
		0.18		0.05					-0.009								455.34
			0.00	0.06					-0.012								463.78
			0.00						-0.002								471.23
																	479.79
			0.00						-0.004								
			0.00						-0.004								487.36
			0.00						0.004								496.12
			0.00						0.005								503.96
233	339	0.09	0.00	-0.01	0.01	0.096	0.000	0.016	-0.009	-4.92	-4.38	2154.16	500.65			-4.36	512.66
\boldsymbol{z}	= 105	(Db)															
			0.00	0.03	0.01	0.308	0.000	-0.001	-0.016	-1.45	-0.48	1752.95	110.09			-0.61	112.58
			0.00	0.03					-0.016								111.64
			0.00	0.03					-0.026								109.60
		0.26		0.03			0.000		-0.023								108.97
		0.23		0.02			0.000		-0.018								106.98
		0.23		0.00		0.250			-0.018								106.41
		0.23		0.00		0.250			-0.018								104.69
			0.00			0.238			-0.015								104.47
		0.22		0.00		0.239			-0.018								103.09
145	250	0.22	0.00	0.00		0.239		0.024	-0.028	-3.97	-2.59	1834.61	101.07			-2.62	103.08
		0.22		0.00		0.239		0.024	-0.028	-4.21	-2.82	1843.81	99.94				101.92
		0.23		0.01		0.251			-0.030				100.17				102.10
148	253	0.23	0.00	0.01		0.251		0.014	-0.030	-5.06	-3.55	1860.59	99.31			-3.57	101.20
149	254	0.23	0.00	0.02	0.03	0.252	0.000	0.002	-0.033	-5.69	-4.06	1868.18	99.79			-4.08	101.64
150	255	0.23	0.00	0.02	0.03	0.252	0.000	0.002	-0.033	-6.06	-4.40	1876.96	99.08			-4.41	100.91
151	256	0.23	0.00	0.02	0.03	0.252	0.000	0.002	-0.033	-6.58	-4.88	1884.27	99.84			-4.90	101.64
				02													

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 105	(Db)															
152 153	257 258 259	0.23 0.23	0.00 0.00 0.00	0.03 0.03 0.04	0.03 0.03 0.03	0.252 0.252 0.253	0.000	-0.010 -0.010 -0.022		-6.88	-5.05	1892.55 1899.19 1906.93					101.41 102.82 103.15
156		0.22	0.00	0.04 0.04	0.02 0.02	0.242 0.242	0.000	-0.025 -0.025	-0.028	-6.70 -6.41	-4.93 -4.68	1913.32 1920.75	103.08 103.72			-4.68	104.78 105.42
158 159 160	264 265	0.21 0.21 0.21	0.00 0.00 0.00 0.00	0.05 0.05 0.06 0.06	0.01 0.01 0.01 0.01	0.242 0.231 0.232 0.232	0.000 0.000 0.000	-0.038 -0.040 -0.052 -0.052	-0.021 -0.023 -0.023	-6.61 -7.31 -7.40	-4.81 -5.18 -5.23	1927.02 1934.40 1940.63 1947.87	106.21 108.05 108.88			-5.22	107.18 107.88 109.72 110.56
162 163 164 165	266 267 268 269 270	0.21 0.21 0.20 0.19	0.00 0.00 0.00 0.00 0.00		0.00 0.00 0.00 0.00 -0.01	0.231 0.232 0.232 0.221 0.209	0.000 0.000 0.000 0.000	-0.065 -0.067 -0.070	-0.015 -0.015 -0.015 -0.004	-8.08 -8.15 -7.59 -7.15	-5.64 -5.71 -5.21 -4.86	1953.83 1960.86 1966.34 1972.56 1977.39	112.03 114.63 116.48 119.72			-5.70 -5.18 -4.84	112.64 113.72 116.31 118.19 121.44
168	272 273	0.17 0.16	0.00 0.00 0.00	0.07 0.06 0.05	0.00	0.209 0.186 0.175	0.000	-0.060 -0.049	-0.011 -0.009	-5.89 -5.08	-4.03 -3.62	1983.28 1988.03 1993.91	125.22 127.41			-4.20 -4.01 -3.60	123.65 126.97 129.19
170 171	274275276	0.14 0.13	0.00 0.00 0.00	0.05 0.04 0.04	0.00 0.00 0.00	0.175 0.152 0.141	0.000	-0.049 -0.040 -0.041	-0.006 -0.006	-4.39 -4.65	-3.18 -3.47	1998.55 2004.29 2009.13	133.18 136.41			-3.17 -3.46	132.64 135.00 138.27
173 174	277278279280	0.12 0.12	0.00 0.00 0.00 0.00	0.04	0.00 -0.01 -0.01 -0.01	0.130 0.130 0.130 0.130	0.000 0.000	-0.042 -0.043 -0.043 -0.054	-0.005 0.005 0.005 0.003	-4.86	-3.71 -3.60	2014.85 2019.57 2025.11 2029.51	142.11 144.64			-3.32 -3.69 -3.58 -3.81	140.66 144.05 146.63 150.37
	282		0.00 0.00 0.01	0.04	-0.02 -0.01 -0.01	0.130 0.097 -0.094	0.000	-0.055 -0.045 -0.020	0.013 0.006 0.012	-4.34	-3.48 -3.29	2034.59 2038.34 2043.54	151.31 155.62			-3.41 -3.26 -3.22	153.44 157.77 160.68
180 181	285 286	-0.07 -0.05 -0.04	0.00	0.01 0.01 0.01	0.00	-0.073 -0.053 -0.042	0.000	-0.010 -0.011 -0.011	0.001 0.001 0.001	-3.37 -3.62	-2.85 -3.05	2047.32 2051.97 2055.73	166.21 170.52				165.02 168.51 172.88
183 184 185		$0.00 \\ 0.00$	0.00 0.00 0.03 0.07 0.08	0.01 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.002	0.000 0.000 -0.040 -0.094 -0.108	-0.012 0.000 0.000 0.002 0.003		-3.40	-2.90 -2.49 -1.97	2060.23 2063.82 2068.09 2070.78 2074.70	178.57 182.37 187.76			-2.90 -2.48 -1.94	176.53 181.08 184.96 190.46 194.72
188 189 190	293 294 295	0.01 0.02 0.22	0.09 0.10 0.00	-0.01 -0.01 0.00	$0.01 \\ 0.01 \\ -0.01$	0.026 0.239	0.000 -0.121 -0.135 0.000	0.015 0.016 0.020	$-0.003 \\ 0.012$	-2.37 -2.58 -0.76	-0.53 -0.38 0.07	2069.45 2081.17 2083.87 2087.56	201.58 206.95 211.33			-0.45 -0.29 0.05	207.77 204.60 210.07 214.46
192 193	296297298299	0.22 0.23	0.00 0.00 0.00 0.00		-0.01 -0.01 0.00 0.00	0.250 0.239 0.250 0.250	0.000 0.000 0.000 0.000	0.022 0.020 0.023 0.011	0.012 0.002 -0.001	-1.18 -1.51 -1.52	-0.27 -0.56 -0.58	2090.53 2094.54 2097.34 2101.16	220.49 225.76 230.02			$-0.28 \\ -0.60$	219.66 223.83 229.18 233.55
196	300 301 302	0.24	0.00 0.00 0.00	0.01 0.01 0.02	0.00 0.01 0.01	0.250 0.262 0.262	0.000 0.000 0.000	0.014 0.002	-0.010 -0.013	-2.02 -2.53	-1.04 -1.46	2103.84 2107.60 2110.20	239.72 245.19			-1.07	239.05 243.51 249.10
199 200	303 304 305 306	0.25 0.25	0.00 0.00 0.00 0.00	0.02 0.03 0.03 0.03	0.01 0.01 0.01 0.02	0.262 0.274 0.274 0.275	0.000	$-0.008 \\ -0.008$	$-0.016 \\ -0.016$	-3.28 -3.50	-2.08 -2.28	2113.80 2116.31 2119.82 2122.23	255.22 259.79			-2.10 -2.30	253.71 259.41 264.12 269.98
202 203 204	307 308 309	0.25 0.25 0.25	0.00 0.00 0.00	0.03 0.03 0.03	0.02 0.02 0.02	0.275 0.275 0.275	0.000 0.000 0.000	-0.007 -0.007 -0.007	-0.026 -0.026 -0.026	-4.23 -4.49 -4.30	-2.91 -3.18 -3.03	2125.46 2127.46 2130.29	270.29 276.36 281.60			-2.85 -3.14 -2.97	274.98 281.20 286.59
206 207	310 311 312 313	0.24 0.24	0.00 0.00 0.00 0.00	0.04 0.03 0.03 0.04	0.02 0.02 0.02 0.02	0.276 0.263 0.263 0.264	0.000	-0.009 -0.009	-0.026 -0.026	-4.22 -4.39	-3.02 -3.21	2132.05 2134.69 2136.31 2138.85	293.34 299.80			-2.96 -3.16	293.09 298.66 305.27 311.02

N	A	ϵ_2	ε_3	ε_4	ε_6	eta_2	β_3	eta_4	eta_6	E_{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	$M_{\rm exp}$ (MeV)	σ_{exp} (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
Z :	= 105	(Db)															
		0.24	0.00	0.04	0.02	0.264	0.000	-0.021	-0.029	-4.62	-3.31	2140.37	311.88			-3.21	317.73
210	315	0.23	0.00	0.04				-0.023				2142.83				-3.12	323.54
211	316	0.24	0.00	0.05	0.02	0.265	0.000	-0.033	-0.031	-5.03	-3.59	2144.33	324.06			-3.45	330.32
		0.23						-0.023				2146.54				-3.30	336.33
213	318	0.23	0.00	0.05	0.02	0.254	0.000	-0.035	-0.031	-5.30	-3.79	2147.93	336.61			-3.64	343.25
		0.23			0.02	0.254	0.000	-0.035	-0.031		-3.79	2150.18	342.43			-3.63	349.28
		0.22						-0.025		-5.40		2151.36				-4.00	356.31
		0.21						-0.014				2153.58				-4.00	362.47
		0.21 0.21						-0.014 -0.026				2154.77 2156.79				-4.47 -4.46	369.55 375.86
		0.21 0.21						-0.026 -0.026		-6.51 -6.48		2157.80 2159.62				-4.87 -4.84	383.13 389.61
		0.21						-0.028				2160.48				-5.23	397.04
		0.20						-0.028				2162.03				-5.07	403.80
223	328	0.20	0.00	0.04	0.02	0.219	0.000	-0.029	-0.028	-6.73	-5.49	2162.52	402.73			-5.36	411.46
224	329	0.19	0.00	0.05	0.02	0.209	0.000	-0.043	-0.030	-6.71	-5.30	2163.91	409.41			-5.10	418.45
225	330	0.19	0.00	0.05				-0.044			-5.53	2164.35	417.03			-5.44	426.20
		0.18						-0.045				2165.40				-5.02	433.48
		0.18										2165.74				-5.27	441.45
		0.18										2166.81				-5.00	448.72
		0.18						-0.058				2167.02				-5.25	456.83
								-0.071				2167.95				-4.91	464.29
								-0.071 -0.071				2168.05 2168.83				-5.16 -4.85	472.52 480.08
								-0.071 -0.084	-0.004			2168.84				-4.63 -5.01	488.53
								-0.085				2169.36					496.38
			0.00	0.08	-0.02	0.167	0.000	-0.063	0.003	-7.01	-4.67	2109.30	404.07			-4.54	470.30
	= 106	_	0.00	0.04	0.01	0.200	0.000	0.012	0.020	1 47	0.40	1001 51	11406			0.60	117.57
		0.28 0.26						-0.013 -0.006				1771.51 1780.16					117.57 116.93
		0.24				0.262			-0.010 -0.020			1790.49					114.64
		0.23				0.250			-0.018			1799.00					114.14
142	248	0.22	0.00	0.00		0.239		0.023	-0.018		-1.37	1809.18	109.58			-1.42	111.98
143	249	0.22	0.00	0.00	0.02	0.239	0.000	0.023	-0.018	-2.71	-1.71	1817.43	109.39			-1.76	111.73
144	250	0.22	0.00	0.00		0.239		0.023	-0.018	-2.94	-1.90	1827.24	107.66			-1.94	109.95
		0.22				0.239						1835.31				-2.36	109.90
		0.23				0.251						1844.89				-2.59	108.35
		0.23				0.251						1852.76				-3.09	108.50
		0.23				0.252						1862.11				-3.37	107.19
		0.23				0.252						1869.73 1878.90				-3.88	107.58
		0.23 0.23										1878.90				-4.24 -4.76	106.47 107.12
		0.23										1894.91					107.12
		0.23										1901.64					107.85
		0.23						-0.022 -0.024				1901.04		106.58	0.039	-4.76	107.83
		0.22						-0.025				1916.17			2.00)	-4.88	109.39
		0.22						-0.037				1923.99				-4.65	109.64
157	263	0.22	0.00	0.05	0.01	0.242	0.000	-0.038	-0.021	-6.65	-4.88	1930.33	109.50			-4.90	111.33
158	264	0.21	0.00	0.06	0.01	0.232	0.000	-0.052	-0.023	-6.89	-4.84	1938.07	109.83			-4.83	111.68
		0.21						-0.052				1944.38		112.82	0.058		113.42
		0.21										1951.97					113.90
		0.21										1958.03					115.90
		0.21										1965.39					116.62
		0.21										1970.89					119.19
n D4												1977.49 1982.37					120.70 123.89
	7)71		11 /	V.U0	-0.01	0.221	0.000	-0.080	-0.007	-1.15	-5.00	1704.3/	144.03			-5.05	143.09
165					-0.01	0.209	0.000	-0.070	-0.004	-6.66	_4 42	1988.57	123 90				125.77

N	A	$arepsilon_2$	ε_3	ϵ_4	ε ₆	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\overline{z}	= 106	5 (Sg)															
	274	_	0.00	0.05	0.00	0.175	0.000	-0.049	-0.009	-5.18	-3.75	1999.51	129.10			-3.73	130.99
	275		0.00	0.06	-0.01	0.175		-0.062				2004.19				-3.62	
	276 277		0.00 0.00	0.05 0.04	0.00	0.153 0.141		-0.052 -0.041				2010.35 2015.24					136.35 139.54
	278		0.00	0.04	0.00	0.141		-0.041 -0.042		-4.90 -4.80		2013.24				-3.72 -3.65	141.52
	279		0.00		-0.01	0.130		-0.054	0.003			2026.13					144.89
	280		0.00			0.130		-0.054	0.003			2032.00					147.13
	281		0.00		-0.02	0.130		-0.055	0.013			2036.47				-4.19	150.80
	282 283		0.00 0.00		-0.02 -0.01	0.108 0.097		-0.057 -0.045	0.014			2041.77 2045.71					153.62 157.76
						-0.094		-0.043 -0.020									160.38
		-0.09 -0.07		0.02		-0.094 -0.073		-0.020 -0.010	0.012 0.001			2051.20 2055.03				-3.66 -3.73	164.65
		-0.05		0.01		-0.053		-0.011	0.001			2060.05					167.76
		-0.03		0.01		-0.032		-0.011	0.000			2063.83					172.12
	288		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2068.69					175.39
	289		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2072.32					179.90 183.51
	290 291		0.00	0.00	0.00	0.000	0.000 -0.081	0.000	0.000			2076.86 2079.41				-3.02 -2.33	189.13
	292		0.07	0.00	0.00		-0.094	0.002	0.003			2083.61					193.10
187	293	0.00	0.08	0.00	0.00	0.003	-0.108	0.003	0.004	-2.95	-1.29	2086.20	195.77			-1.24	198.67
	294		0.09	0.00	0.01		-0.121	0.003	-0.005			2090.16				-0.55	202.90
	295			-0.01	0.01		-0.135		-0.003			2092.92				-0.42	208.32
	296 297		0.10	-0.01 0.00	0.01 -0.01	0.026 0.239	-0.135 0.000	0.016	-0.003 0.012	-2.17 -0.80		2096.87 2099.53				0.08	212.54 217.94
	298		0.00		-0.01	0.239	0.000	0.020	0.012			2103.85					221.80
193	299	0.23	0.00	0.01	-0.01	0.250	0.000	0.010	0.009	-1.21	-0.33	2106.68	223.72			-0.35	227.13
	300		0.00	0.01	0.00	0.250	0.000		-0.001	-1.21		2110.80				-0.38	231.18
	301		0.00	0.01	0.00	0.250	0.000		-0.001			2113.48				-0.71	236.68
	302 303		0.00 0.00	0.02	0.00	0.262 0.262	0.000 0.000		-0.004 -0.004			2117.57 2120.18				-0.86 -1.28	240.78 246.35
	304		0.00	0.03	0.01	0.274		-0.008				2124.14				-1.43	250.64
	305		0.00	0.03	0.01	0.274						2126.66				-1.92	256.31
	306		0.00	0.03	0.01	0.274						2130.48				-2.13	260.70
	307		0.00	0.03	0.01	0.274						2132.83					266.54
	308		0.00	0.04	0.01	0.287						2136.39				-2.70	
	309 310		0.00 0.00	0.03	0.02	0.275 0.276						2138.42 2141.60					277.45 282.52
	311		0.00	0.04	0.02	0.276						2143.36					288.98
	312		0.00	0.04	0.02	0.264						2146.25					294.34
	313		0.00	0.04	0.02	0.264						2147.90					300.90
	314		0.00	0.04	0.02	0.264						2150.75					306.30
	315 316		0.00 0.00	0.06	0.01	0.277 0.277						2152.34 2155.11				-3.15	312.93
	317		0.00	0.07	0.01	0.278						2156.67				-3.44	
212	318	0.25	0.00	0.07	0.01	0.278	0.000	-0.056	-0.028	-5.32	-3.57	2159.32	324.43			-3.40	330.76
	319	0.25	0.00	0.07	0.01	0.278						2160.60					337.72
	320		0.00	0.06	0.02	0.266						2163.08					343.56
	321 322		0.00 0.00	0.06 0.05	0.02	0.255 0.243						2164.27 2166.63				-3.89	350.63 356.50
	323		0.00	0.03	0.02	0.243						2167.83				-3.88 -4.27	
	324		0.00	0.04	0.03	0.231						2170.12					369.64
	325		0.00	0.04	0.03	0.231						2171.11				-4.69	
	326		0.00	0.04	0.03	0.231						2173.21				-4.66	
	327 328		0.00 0.00	0.04 0.04	0.03	0.220 0.220						2174.08 2175.91					390.53
																	397.00
	329 330		0.00 0.00	0.05	0.02	0.220						2176.49 2178.16					404.62 411.26
	-550	0.17	0.00	0.03	0.02	0.207	3.000	J.U-13	0.050	0.50	J.22	21/0.10	102.73			5.01	.11.20

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
Z =	= 106	(Sg)															
225		0.19	0.00	0.05	0.01	0.208						2178.43				-5.17	419.19
226			0.00		0.01	0.197						2179.95				-4.95	425.99
227 228			0.00 0.00		0.00 0.00	0.198 0.198						2180.29 2181.69				-5.20 -4.98	433.95 440.88
229			0.00		0.00	0.198						2181.89				-5.23	448.99
	336				-0.01	0.198						2183.13				-4.92	
231					-0.01	0.198	0.000		-0.004			2183.23				-5.18	464.36
232					-0.02	0.198	0.000	-0.084				2184.39				-4.86	
233	339	0.18	0.00	0.08	-0.02	0.198	0.000	-0.084	0.004	-7.50	-5.36	2184.31	468.93			-5.06	480.05
Z =	= 107	(Bh)															
140			0.00		0.01	0.262	0.000					1788.32					124.33
141			0.00		0.02	0.251	0.000					1797.18				-1.29	123.49
142	249		0.00 0.00		0.02	0.251 0.251	0.000 0.000		-0.021 -0.021			1807.33 1816.04					121.35 120.64
144			0.00		0.02	0.231	0.000					1825.90					118.81
145			0.00		0.02	0.240	0.000					1834.30					118.41
146			0.00		0.02	0.251	0.000		-0.023			1843.93				-2.77	116.80
147		0.23	0.00	0.02	0.02	0.251	0.000		-0.023			1852.15				-3.26	116.59
148			0.00		0.02	0.252	0.000					1861.57				-3.58	115.20
149			0.00		0.03	0.252						1869.57				-4.09	115.24
150 151			0.00 0.00		0.03	0.252 0.252			-0.036 -0.036			1878.81 1886.52				-4.48 -4.99	114.04 114.35
151			0.00		0.03	0.252						1895.26					114.33
153			0.00		0.03	0.253			-0.029			1902.32					114.61
154			0.00		0.02	0.254						1910.52				-5.15	114.47
155	262	0.22	0.00	0.05	0.02	0.243	0.000	-0.037	-0.031	-7.19	-5.26	1917.37	113.60			-5.29	115.66
156	263	0.22	0.00	0.05	0.01	0.242	0.000	-0.038	-0.021	-6.79	-5.07	1925.23	113.82			-5.10	115.85
157			0.00		0.01	0.243		-0.050		-7.41		1932.01				-5.41	117.11
158			0.00		0.01	0.232						1939.81				-5.38	117.39
159			0.00		0.01	0.232						1946.46					118.78
160 161			0.00 0.00		0.00	0.232 0.232		-0.065		-8.23 -8.67		1954.16 1960.58				-5.93 -6.37	119.15 120.78
162			0.00		0.00	0.232						1967.93					120.78
	270		0.00		0.00	0.222						1973.81					123.72
164	271	0.20	0.00	0.08	-0.01	0.221	0.000	-0.080	-0.007	-8.73	-6.03	1980.45	123.17			-6.00	125.15
165	272	0.20	0.00	0.08	-0.02	0.221	0.000	-0.081	0.002	-8.38	-5.70	1985.66	126.03			-5.67	128.01
166					-0.01	0.210						1991.87				-4.99	129.90
167					-0.01	0.198						1996.94					132.89
168	275 276				-0.01 -0.01	0.175 0.175						2002.96 2008.08					134.96 137.92
170 171				0.05	-0.01 0.00	0.152 0.130		-0.052 -0.042				2014.31 2019.56					139.79 142.62
172					-0.00	0.130		-0.042 -0.043				2019.30					144.58
173					-0.01	0.130		-0.054				2030.79					147.60
174					-0.01	0.130	0.000	-0.054				2036.67				-4.49	149.83
175					-0.02	0.130		-0.055	0.013			2041.46					153.17
176					-0.02	0.130		-0.055				2046.87				-4.38	155.88
177					-0.01	0.097		-0.045				2051.04				-4.29	159.79
		-0.08 -0.07				-0.084 -0.073		-0.021 -0.010	0.002			2056.43 2060.63				-4.11 -4.22	162.49 166.41
		-0.07				-0.073 -0.053		-0.010				2065.68				-3.87	169.49
181			0.00		0.00	-0.033	0.000	-0.011				2069.74					173.55
182			0.00		0.00	0.000	0.000	0.000				2074.67				-3.75	176.76
183			0.00		0.00	0.000	0.000	0.000				2078.60					180.96
184	291	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.06	-3.49	2083.14	181.90			-3.49	184.56
185			0.06		0.00		-0.081	0.002				2085.99					189.88
186	293	-0.01	0.07	0.00	0.00	-0.008	-0.094	0.002	0.003	-3.60	-2.19	2090.21	190.98			-2.16	193.82

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p}	E _{mic} (MeV)	E _{bind} (MeV)	M _{th}	M _{exp} (MeV)	σ _{exp}	E _{mic} (MeV)	M _{th} FL (MeV)
	= 107	(Rh)								(1.10)	(1120 +)	(1.10 +)	(1.10 +)	(2120 1)	(1.10)	(1.10)	(1.20)
	294	` '	0.08	0.00	0.00	0.003	-0.108	0.003	0.004	-3.38	-1.71	2093.07	196.18			-1.67	199.10
188	295		0.08	0.00	0.00	0.003	-0.108	0.003	0.004			2097.03				-0.98	203.31
	296	-0.64		-0.01	-0.02	-0.630	0.000		-0.026	-3.13		2092.23					215.82
	297		0.10	0.00	0.01		-0.134		-0.004	-2.44		2103.98				-0.25	212.71
	298		0.11		0.02		-0.148		-0.012	-2.78		2106.85				-0.08	218.04
	299 300		0.00		-0.01 -0.01	0.250 0.250	0.000 0.000	0.010 0.010	0.009	-0.89 -1.26		2111.06 2114.20				-0.14 -0.46	221.86 226.88
193			0.00			0.250	0.000	-0.003	0.009	-1.20 -1.31		2114.20				-0.46	230.95
	302		0.00	0.02	0.00	0.262	0.000		-0.004			2121.31				-0.81	236.11
196	303	0.24	0.00	0.02	0.00	0.262	0.000	0.001	-0.004	-1.79	-0.87	2125.36	236.53			-0.91	240.24
197	304	0.24	0.00	0.02	0.00	0.262	0.000	0.001	-0.004	-2.24	-1.34	2128.34	241.63			-1.39	245.45
	305		0.00	0.03	0.00	0.263			-0.006			2132.26				-1.52	249.73
	306 307		0.00	0.03	0.01	0.274 0.274						2135.12 2138.95				-2.03 -2.24	255.07 259.45
	308		0.00	0.03	0.01	0.274						2136.93				-2.24 -2.74	264.97
	309		0.00	0.04	0.01	0.287		-0.018				2145.20				-2.83	269.62
	310		0.00	0.04	0.01	0.275		-0.020				2147.42				-3.04	275.61
204	311	0.25	0.00	0.04	0.01	0.275	0.000	-0.020	-0.019	-4.17	-2.95	2150.64	275.83			-2.94	280.61
	312		0.00	0.05	0.01	0.276		-0.032				2152.71				-3.13	286.77
	313		0.00	0.05	0.01	0.276		-0.032				2155.68				-2.94	292.04
	314		0.00	0.06	0.01	0.277		-0.044				2157.67				-3.18	298.30
	315 316		0.00	0.06 0.06	0.01	0.277 0.277		-0.044 -0.044				2160.57 2162.46				-3.08 -3.40	303.64 309.98
	317		0.00	0.07	0.01	0.278		-0.056				2165.31				-3.35	315.42
	318		0.00	0.07	0.01	0.278	0.000	-0.056	-0.028			2167.07				-3.69	321.89
212	319	0.25	0.00	0.08	0.01	0.279	0.000	-0.068	-0.031	-5.99	-3.83	2169.77	321.27			-3.62	327.51
	320		0.00	0.08	0.01	0.279		-0.068				2171.44				-4.01	334.08
	321		0.00	0.07	0.01	0.267		-0.058				2173.86					339.87
	322 323		0.00	0.07 0.06	0.01 0.02	0.267 0.255		-0.058 -0.047				2175.25 2177.67				-4.17 -4.12	346.73 352.63
	324		0.00	0.05	0.02	0.243		-0.037				2178.99				-4.49	359.51
	325		0.00	0.05	0.02	0.231		-0.039				2181.22				-4.44	365.56
	326		0.00	0.05	0.02	0.231						2182.52					372.52
	327		0.00	0.04	0.03	0.220						2184.71					378.71
	328		0.00	0.04	0.03	0.220						2185.85					385.84
	329 330		0.00	0.05	0.02	0.220						2187.70 2188.65					392.20 399.54
	331		0.00	0.05	0.02	0.220						2190.15					406.34
	332		0.00	0.05	0.01	0.208						2190.88					413.80
226	333	0.18	0.00	0.05	0.01	0.197	0.000	-0.045	-0.019	-6.81	-5.37	2192.44	411.60			-5.27	420.55
227	334	0.18	0.00	0.06	0.00	0.198						2193.09				-5.56	428.20
	335		0.00	0.06	0.00	0.198						2194.49					435.12
	336 337		0.00		-0.01 -0.01	0.198 0.198						2195.01 2196.25					442.96 450.04
	338		0.00		-0.01	0.198						2196.62					457.98
	339		0.00		-0.02	0.198						2197.82					465.23
			0.00	0.00	0.02	0.170	0.000	0.001	0.001	7.70	3.00	2177.02	13 1.03			3.31	103.23
	= 108 250		0.00	0.02	0.01	0.251	0.000	_0.001	_0.013	_1 79	_1.05	1806.69	126.65			_1 13	129.54
	251		0.00	0.02	0.01	0.231	0.000					1815.32					128.92
	252		0.00	0.01	0.02	0.240	0.000	0.011	-0.021	-2.53	-1.60	1825.57	123.91				126.69
	253		0.00	0.01	0.02	0.240	0.000					1834.07					126.18
	254		0.00	0.02	0.02	0.240						1844.07					124.20
	255		0.00	0.02	0.02	0.240						1852.32					123.96
	256 257		0.00	0.03 0.04	0.02	0.241 0.253						1862.13 1870.14					122.18 122.17
	258		0.00	0.04	0.02	0.253						1879.72					120.63
	259		0.00	0.04	0.02	0.253						1887.46					120.91

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 108	(Hs)															
	260	` ′	0.00	0.04	0.02	0.253	0.000	-0.023	-0.029	-6.28	-4.73	1896.55	117.50			-4.76	119.86
153	261	0.23	0.00	0.05	0.02	0.254	0.000	-0.035	-0.031	-6.73	-4.92	1903.73	118.39			-4.95	120.71
	262	0.22		0.05	0.02	0.243		-0.037				1912.32					120.18
	263		0.00	0.05	0.01	0.242		-0.038		-6.65		1919.21		110.60	0.044		121.30
	264		0.00	0.06	0.01	0.243			-0.023			1927.52		119.60	0.044		121.05
	265 266	0.22	0.00	0.06	0.01	0.243 0.232		-0.050 -0.052		-7.16 -7.19		1934.33 1942.52				-5.24 -5.26	122.28 122.15
	267		0.00	0.00	0.00	0.232			-0.025 -0.015			1942.32					122.13
	268		0.00	0.07	0.00	0.232			-0.015		-5.90	1957.33	121.29				123.44
161	269	0.21	0.00	0.07	0.00	0.232	0.000	-0.065	-0.015	-8.57	-6.27	1963.73	122.96			-6.28	125.10
	270	0.20	0.00	0.08	0.00	0.222	0.000	-0.079	-0.017			1971.48					125.44
	271		0.00	0.08	-0.01	0.221			-0.007	-9.24		1977.48					127.49
	272273		0.00		-0.01 -0.02	0.221 0.221		-0.080 -0.081	-0.007 0.002	-8.76 -8.42		1984.48 1989.72					128.57 131.40
	274		0.00		-0.02	0.209		-0.083				1996.24					132.97
167	275	0.18	0.00	0.08	-0.02	0.198	0.000	-0.084	0.004	-7.41		2001.32				-4.79	135.97
	276		0.00		-0.01	0.175	0.000	-0.062	-0.001	-6.01		2007.68				-4.19	137.67
	277		0.00		-0.01	0.164		-0.063	0.000			2012.89					140.54
	278279		0.00	0.04	0.00	0.130 0.130		-0.042	-0.005 -0.005	-5.32		2019.54 2024.87				-4.17 -4.59	141.96 144.71
	280		0.00		-0.00	0.130		-0.042 -0.043		-5.68		2024.87				-4.59	144.71
	281		0.00		-0.01	0.130		-0.043 -0.054	0.005			2031.37					140.32
	282		0.00		-0.02	0.130		-0.055	0.013	-6.31		2042.73					151.19
	283		0.00		-0.02	0.108		-0.057	0.014	-6.59		2047.51					154.52
176	284	0.09	0.00	0.05	-0.02	0.097	0.000	-0.057	0.015	-6.28	-4.84	2053.34	154.42			-4.77	156.80
	285		0.00		-0.02	0.086		-0.046	0.016			2057.69					160.55
	286	-0.08 -0.05		0.01		-0.084 -0.053		-0.009 -0.011	0.010	-5.13 -5.28		2063.36 2067.58				-4.62 -4.74	162.94 166.83
		-0.03 -0.04		0.01		-0.033 -0.042		-0.011	0.001	-5.28 -5.04		2007.38				-4.74 -4.45	169.51
		-0.03		0.01		-0.032		-0.011	0.000			2077.16					173.50
182	290	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.95	-4.33	2082.34	173.85			-4.33	176.43
	291		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.16		2086.27				-4.53	180.64
	292 293		0.00 0.04	0.00 0.00	0.00 0.00	0.000 0.001	0.000 -0.054	0.000 0.001	0.000			2091.11 2093.79					183.93 189.40
	294		0.04	0.00	0.00		-0.054	0.001				2098.28					193.05
187	295	0.00	0.07	0.00	0.00	0.002	-0.094	0.002	0.003	-3.30	-1.91	2101.05	195.50			-1.88	198.45
188	296	0.00	0.08	0.00	0.00	0.003	-0.108	0.003				2105.27					202.39
						-0.630	0.000		-0.026			2100.36					215.06
	298 299			-0.01 -0.01	-0.03 0.01	-0.629 0.026	0.000 -0.135		-0.019			2104.73 2115.26					218.91 216.90
							0.000										
	300 301		0.00		-0.01 -0.01	0.250 0.250	0.000	0.010 0.010		-0.51 -0.88		2119.50 2122.66					220.73 225.73
	302		0.00		-0.01	0.250	0.000	0.010				2127.09					229.47
	303		0.00		-0.01	0.251	0.000	-0.003				2130.09					234.63
196	304		0.00	0.02	0.00	0.262	0.000	0.001	-0.004	-1.39	-0.62	2134.48	234.71			-0.65	238.41
	305		0.00	0.02	0.00	0.262	0.000					2137.41					243.65
	306 307		0.00	0.03	0.00	0.274 0.274						2141.64 2144.47					247.62 252.97
	308		0.00	0.03	0.00	0.274						2144.47					257.02
	309		0.00	0.03	0.01	0.286						2151.31					262.53
202	310	0.26	0.00	0.04	0.01	0.287	0.000	-0.018	-0.019	-3.67	-2.51	2155.18	262.44			-2.50	266.90
	311		0.00	0.04	0.01	0.287						2157.43					272.84
	312		0.00	0.04	0.01	0.275						2160.89					277.60
	313 314		0.00	0.05 0.05	0.01	0.276 0.276						2162.98 2166.24					283.74 288.70
	315		0.00	0.06	0.01	0.277						2168.25					294.94
	316		0.00	0.06	0.01	0.277						2171.44					299.98

N	A	$arepsilon_2$	ϵ_3	ϵ_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 108	(Hs)															
	317	` '	0.00	0.07	0.00	0.278	0.000	-0.057	-0.018	-4.88	-3.12	2173.32	300.79			-3.03	306.32
210	318	0.25	0.00	0.07	0.00	0.278	0.000	-0.057	-0.018	-4.80	-3.08	2176.41	305.77			-2.98	311.47
	319		0.00		0.00			-0.069				2178.28				-3.37	
	320		0.00		0.00			-0.069				2181.23					323.17
213			0.00		0.01							2182.95					329.75
	322 323		0.00 0.00		0.01			-0.058 -0.060		-5.47 -5.81		2185.65 2187.04				-3.60 -3.84	335.25 342.11
	324		0.00		0.01			-0.049				2189.72				-3.64 -3.77	347.74
	325		0.00		0.02			-0.049				2191.11				-4.15	354.60
218	326	0.21	0.00	0.05	0.02	0.231	0.000	-0.039	-0.030	-5.60	-4.28	2193.57	353.18			-4.10	360.36
	327		0.00		0.02				-0.030			2194.87				-4.52	367.32
	328		0.00		0.02				-0.030	-6.00		2197.25				-4.48	373.21
	329 330		0.00 0.00		0.02			-0.041		-6.43		2198.42 2200.66				-4.90 -4.86	380.31 386.36
	331		0.00		0.02							2201.43				-5.02	393.86
	332		0.00		0.01			-0.044		-6.38		2203.37				-4.89	400.13
	333		0.00		0.01				-0.019			2204.20				-5.23	407.59
	334		0.00		0.00				-0.009			2206.05				-5.12	413.98
	335		0.00		0.00							2206.77				-5.43	421.60
	336		0.00		0.00	0.000		0.000	0.000			2208.98				-5.87	
	337	-0.01	0.00		0.00	-0.011 0.000		0.000 0.000	0.000			2209.37					435.49
	338 339		0.00		0.00 0.00	0.000		0.000	0.000			2210.95 2211.12				-5.85 -5.90	442.22 450.37
			0.00	0.00	0.00	0.011	0.000	0.000	0.000	0.57	3.70	2211.12	110.57			5.70	130.37
	= 109 253	(Mt)	0.00	0.02	0.01	0.240	0.000	0.002	0.013	2 22	1 55	1823.24	133 52			1.64	136.54
	254		0.00		0.01				-0.013			1832.05					135.74
146	255	0.22	0.00	0.03	0.01	0.241	0.000	-0.014	-0.016	-3.22	-2.35	1842.20	130.71				133.60
	256		0.00		0.01				-0.016			1850.77					133.03
	257		0.00		0.01				-0.016			1860.61				-3.21	131.21
	258		0.00		0.01				-0.019			1868.95				-3.69	130.87
	259 260		0.00 0.00		0.02			-0.025 -0.025		-5.48 -6.03		1878.60 1886.70				-4.10 -4.60	129.27 129.18
152			0.00		0.02			-0.025				1895.83					128.09
	262		0.00		0.02							1903.38				-4.98	128.56
154	263	0.22	0.00	0.05	0.01	0.242	0.000	-0.038	-0.021	-6.48	-4.90	1912.04	125.44			-4.95	127.93
	264		0.00		0.01							1919.34					128.66
	265		0.00		0.00							1927.70				-5.10	128.33
	266 267		0.00 0.00		0.00 0.00							1934.92 1943.16					129.16 128.98
	268		0.00		0.00							1950.28					129.90
	269		0.00		0.00							1958.39					129.90
	270				-0.01							1965.19					131.09
162		0.20	0.00	0.08	-0.01							1973.06					131.30
163	272	0.20	0.00	0.08	-0.01	0.221	0.000	-0.080	-0.007	-9.66	-7.00	1979.43	130.70			-7.01	132.99
	273				-0.01							1986.45					134.04
	274275				-0.02 -0.02			-0.093 -0.083	0.000			1992.10 1998.63					136.47 138.01
	276				-0.02 -0.02			-0.083 -0.084				2004.03					140.68
	277				-0.01							2010.40					142.37
	278	0.14	0.00	0.05	0.00							2016.00					144.84
170	279		0.00		0.00							2022.73					146.19
	280				-0.01			-0.043	0.005			2028.41					148.60
	281				-0.01			-0.054	0.003			2034.92					150.19
	282				-0.01			-0.054	0.003			2040.35					152.85
	283 284				-0.02 -0.02			-0.055 -0.057				2046.62 2051.74					154.70 157.69
	285				-0.02 -0.02			-0.057 -0.057				2057.55					157.09

N	A	$arepsilon_2$	ε_3	ϵ_4	ε_6	β_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 109	(Mt)															
177		` ′	0.00	0.04	-0.01	0.086	0.000	-0.045	0.007	-6.49	-5.39	2062.18	160.95			-5.36	163.43
		-0.08				-0.084	0.000	-0.021				2067.94				-5.21	165.74
		-0.04 -0.03				-0.042 -0.032	0.000 0.000	0.001				2072.49 2077.95				-5.33 -5.05	169.30 171.96
		-0.03 -0.01				-0.032 -0.011	0.000	0.000				2082.45					175.58
182			0.00		0.00	0.000	0.000	0.000				2087.68				-4.99	178.47
183		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.81		2091.91				-5.17	182.36
184			0.00		0.00	0.000	0.000	0.000		-5.28		2096.75				-4.67	185.65
185 186			0.01 0.03		0.00		-0.013 -0.040	0.000 0.000	0.000			2099.71 2104.21				-3.76 -3.09	190.82 194.46
	296		0.03				-0.040			-3.79 -3.57							199.62
188			0.00		0.00 0.00		-0.081 -0.094	0.002	0.002	-3.37 -3.02		2107.20 2111.42				-2.39 -1.62	203.56
189			0.08		0.01		-0.107	0.003				2114.50				-1.19	208.64
190			0.09		0.01		-0.121					2118.67				-0.56	212.63
191			0.09		0.01		-0.121		-0.005			2121.85				-0.41	217.61
192			0.10		0.02		-0.133		-0.013	-2.12		2125.97				0.13	221.69
193 194					-0.01 -0.01	0.250 0.250	0.000 0.000	0.010 0.010		-0.83 -0.87		2129.29 2133.75				-0.19 -0.20	226.38 230.10
195					-0.01	0.262	0.000	-0.001		-1.27		2137.12				-0.60	234.88
196					-0.01	0.262	0.000	-0.001	0.006	-1.35		2141.45				-0.67	238.73
197	306	0.25	0.00	0.02	0.00	0.273	0.000	0.003	-0.003	-1.78	-1.03	2144.67	239.88			-1.09	243.66
198			0.00		0.00	0.285	0.000					2148.93				-1.25	247.59
199			0.00		0.00	0.274	0.000					2152.03				-1.71	252.66
200201			0.00		0.00	0.285 0.286						2156.19 2159.18				-1.93 -2.42	256.70 261.91
202			0.00		0.01	0.287						2163.02				-2.46	266.30
202			0.00		0.01	0.287			-0.019			2165.57					271.92
204			0.00		0.01	0.287						2169.01				-2.52	276.70
205			0.00		0.00	0.276			-0.012			2171.33				-2.68	282.57
206			0.00		0.00	0.277						2174.66				-2.53	287.49
207 208			0.00		0.00	0.277			-0.015			2176.97				-2.82 -2.73	293.38 298.40
208			0.00		0.00	0.278 0.278		-0.057 -0.057				2180.22 2182.40					304.43
	319		0.00		0.00	0.279						2185.55					309.56
211	320	0.25	0.00	0.08	0.00	0.279	0.000	-0.069	-0.021	-5.56	-3.53	2187.69	309.86			-3.41	315.64
212	321	0.25	0.00	0.08	0.00	0.279	0.000	-0.069	-0.021	-5.47	-3.50	2190.64	314.98			-3.37	320.94
213			0.00		0.00	0.279						2192.58					327.21
214215			0.00		0.00	0.267 0.255						2195.25 2197.03					332.81 339.27
216			0.00		0.01	0.243						2199.62					344.90
217			0.00		0.01	0.243						2201.24				-4.13	351.52
218			0.00		0.02	0.219						2203.81					357.22
219			0.00		0.02	0.220						2205.45				-4.57	363.88
220			0.00		0.02	0.220						2207.91					369.69
	330		0.00		0.02	0.220						2209.35					376.50
222223			0.00		0.02	0.209 0.208						2211.43 2212.64					382.71 389.67
224			0.00		0.01	0.208						2212.04					395.92
	334		0.00		0.01	0.197						2215.85					403.03
226	335	0.18	0.00	0.06	0.00	0.198	0.000	-0.058	-0.012	-7.10	-5.51	2217.77	400.85			-5.41	409.41
	336		0.00		0.00	0.198						2218.73					416.73
228			0.00		0.00	0.000	0.000	0.000				2221.42					422.23
229	338 339	-0.01	0.00		0.00	-0.011 0.000	0.000 0.000	0.000 0.000				2222.06 2223.62					429.89 436.62
			5.50	0.00	0.00	5.000	3.000	5.000	5.000	1.12	0.57		.27.20			0.57	150.02
		(Ds)	0.00	0.02	0.01	0.220	0.000	0.004	0.012	0.51	1.70	1041 22	120.00			1.70	140.05
	256 257		0.00		0.01	0.229						1841.32 1849.91					142.05 141.46
	231	0.21	0.00	0.02	0.01	3.227	5.000	J.00 1	0.013	2.70	2.13	1017.71	150.50			2.22	

1949 299 0.21 0.010 0.013 0.011 0.229 0.0000 0.026 0.010 -4.03 -3.10 1808.00 138.81 -3.17 151 261 0.22 0.000 0.04 0.01 0.241 0.0000 0.025 -0.028 -5.33 -3.97 1886.67 133.88 -4.03 151 262 0.22 0.000 0.04 0.02 0.242 0.0000 -0.025 -0.028 -5.33 -3.97 1886.67 133.88 -4.03 151 262 0.22 0.000 0.05 0.01 0.242 0.000 -0.025 -0.028 -5.33 -3.97 1886.67 133.88 -4.03 151 151 152 0.00 0.05 0.01 0.242 0.000 -0.038 -0.021 -5.84 -4.35 1903.74 132.96 -4.42 154 264 0.22 0.00 0.05 0.01 0.242 0.000 -0.038 -0.021 -5.84 -4.35 1903.74 132.96 -4.42 155 265 0.22 0.00 0.06 0.03 0.231 0.000 -0.053 -0.011 -5.82 -4.35 192.07 132.00 -4.46 155 265 0.22 0.00 0.06 0.000 0.023 -0.001 -5.84 -4.35 1903.74 132.96 -4.42 136.12 132.87 -4.07 135 266 0.21 0.00 0.06 0.00 0.033 -0.015 -0.014 -6.22 -4.59 1923.13 132.71 -4.65 135 269 0.21 0.00 0.07 -0.01 0.232 0.000 -0.056 -0.015 -0.015 -0.014 -6.22 -4.59 1923.13 132.01 -4.65 14.02	N A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Z = 11	10 (Ds)															
150 200 0.22 0.00 0.04 0.01 0.241 0.000 0.0026 0.019 -4.62 -3.47 1878.54 133.94 -3.53 155 261 0.22 0.00 0.04 0.02 0.242 0.000 0.0025 -0.028 -3.53 -3.97 188.66 132.47 -4.19 1 152 262 0.22 0.00 0.04 0.02 0.242 0.000 -0.035 -0.028 -5.53 -4.15 1896.16 132.47 -4.19 1 154 264 0.22 0.00 0.05 0.01 0.242 0.000 -0.038 -0.021 -5.84 -4.36 1903.74 122.96 -4.40 1 155 265 0.22 0.00 0.06 0.010 0.245 0.000 -0.083 -0.021 -5.84 -4.36 1903.74 122.96 -4.40 1 155 265 0.22 0.00 0.06 0.010 0.245 0.000 -0.053 -0.014 -6.26 -4.59 1920.13 132.71 -4.65 1 157 267 0.21 0.00 0.06 0.010 0.231 0.000 -0.055 -0.013 -6.27 -4.59 1923.01 132.21 -4.65 1 157 267 0.21 0.00 0.06 0.000 0.033 0.000 -0.055 -0.013 -6.67 -4.95 1936.12 132.87 -4.77 1 159 269 0.21 0.00 0.07 -0.01 0.232 0.000 -0.065 -0.056 -0.06 -7.67 -5.58 1951.94 133.19 -5.62 1 1 0.20 0.00 0.08 -0.01 0.221 0.000 -0.065 -0.006 -7.67 -5.58 1951.94 133.19 -5.62 1 0.27 0.20 0.00 0.08 -0.01 0.221 0.000 -0.080 -0.007 -0.07 -6.50 1975.56 137.77 -6.50 1 162 272 0.20 0.00 0.08 -0.01 0.221 0.000 -0.080 -0.007 -0.07 -6.50 1975.56 137.77 -6.50 1 162 272 0.20 0.00 0.08 -0.01 0.221 0.000 -0.080 -0.007 -0.07 -6.50 1975.56 137.77 -6.50 1 162 272 0.20 0.00 0.08 -0.00 0.08 -0.007 -0.07 -6.50 1975.56 137.77 -6.50 1 162 272 0.00 0.08 -0.00 0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.08 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00		` '	0.00	0.03	0.01	0.241	0.000	-0.014	-0.016	-3.47	-2.62	1860.22	136.12			-2.68	139.15
151 202 0.22 0.00 0.04 0.02 0.242 0.000 -0.025 -0.028 -5.33 -3.97 1886.07 132.87 -4.19 1 152 202 0.22 0.00 0.05 0.01 0.242 0.000 -0.025 -0.028 -5.53 -4.15 1896.16 132.47 -4.19 1 154 264 0.22 0.00 0.05 0.01 0.242 0.000 -0.038 -0.021 -5.84 -4.35 1901.77 132.00 -4.44 1 154 264 0.22 0.00 0.06 0.00 0.231 0.000 -0.058 -0.021 -5.82 -4.36 1912.77 132.00 -4.46 155 265 0.22 0.00 0.06 0.00 0.231 0.000 -0.058 -0.013 -6.27 -4.59 1923.13 132.71 -4.65 1 156 266 0.21 0.00 0.06 0.00 0.231 0.000 -0.058 -0.013 -6.27 -4.59 1923.13 132.01 -4.65 1 158 268 0.21 0.00 0.07 0.00 0.232 0.000 -0.066 -0.015 -7.17 -5.07 1944.79 132.26 -5.10 -5.62 1 160 270 0.21 0.00 0.07 -0.01 0.232 0.000 -0.066 -0.006 -7.85 -5.77 1960.40 132.79 -5.79 1 161 271 0.00 0.07 -0.01 0.232 0.000 -0.066 -0.006 -7.85 -5.77 1960.40 132.79 -5.79 1 162 271 0.20 0.00 0.08 -0.01 0.221 0.000 -0.080 -0.007 -8.65 6.30 1967.33 13.94 -6.632 1 162 272 0.20 0.00 0.08 -0.01 0.221 0.000 -0.080 -0.007 -8.65 6.30 1967.33 13.94 -6.632 1 164 274 0.20 0.00 0.09 -0.02 0.222 0.000 -0.080 -0.007 -8.65 -6.57 1918.16 13.55 13.57 -6.50 1 164 274 0.20 0.00 0.09 -0.02 0.222 0.000 -0.090 -0.000																	138.78
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																	136.86
$\begin{array}{c} 1.53 \ 263 \ 0.22 \ 0.00 \ 0.05 \ 0.01 \ 0.242 \ 0.000 \ -0.038 \ -0.021 \ -5.84 \ -4.36 \ 1903.74 \ 132.06 \ $																	136.75 135.30
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$\begin{array}{c} 158\ 268\ 0\ 21\ 0.00\ 0.07\ 0.00\ 0.07\ 0.00\ 0\ 0.232\ 0.000\ -0.065\ -0.015\ -7.17\ -5.07\ 1944.79\ 132.26 \\ -5.10\ 179\ 269\ 0.21\ 0.00\ 0.07\ -0.01\ 0.232\ 0.000\ -0.066\ -0.006\ -7.88\ -5.77\ 190.40\ 133.19 \\ -5.02\ 1\ 100\ 270\ 0.21\ 0.000\ 0.07\ -0.01\ 0.232\ 0.000\ -0.066\ -0.006\ -7.88\ -5.77\ 190.40\ 133.19 \\ -5.02\ 1\ 100\ 270\ 0.00\ 0.00\ 0.08\ -0.01\ 0.221\ 0.000\ -0.080\ -0.007\ -8.86\ -6.30\ 1967.33\ 133.94 \\ -6.32\ 1\ 100\ 270\ 0.000\ 0.00\ 0.08\ -0.01\ 0.221\ 0.000\ -0.080\ -0.007\ -8.86\ -6.30\ 1967.33\ 133.94 \\ -6.32\ 1\ 100\ 0.000\ 0.000\ 0.000\ 0.000\ 0.000\ 0.000\ 0.000\ -0.000\ 0.000\ -0.000\ 0.000\ -0.000\ -0.000\ 0.000\ -0.000\ 0.000\ -0$																	134.65
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	57 26	0.21	0.00	0.06	0.00	0.231	0.000	-0.053	-0.013	-6.67	-4.92	1936.12	132.87			-4.97	135.47
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	58 26	0.21	0.00			0.232	0.000	-0.065	-0.015	-7.17	-5.07	1944.79	132.26			-5.10	134.85
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168 278 0.16 0.00 0.06 -0.01 0.175 0.000 -0.062 -0.001 -6.39 -4.66 2014.24 143.53 -4.65 169 279 0.12 0.00 0.04 0.00 0.130 0.000 -0.042 -0.005 -6.11 -4.98 2020.04 145.80 -4.97 1.70 1281 0.12 0.00 0.04 0.00 0.130 0.000 -0.042 -0.005 -6.11 -4.98 2020.04 145.80 -4.97 1.70 1281 0.12 0.00 0.04 0.00 0.130 0.000 -0.042 -0.005 -6.11 -4.98 2020.04 145.80 -4.97 1.70 1.71 281 0.12 0.00 0.04 0.00 0.130 0.000 -0.042 -0.005 -6.52 -5.38 2032.83 149.15 -5.38 1.72 282 0.12 0.00 0.04 -0.01 0.130 0.000 -0.044 0.005 -6.66 -5.33 2039.68 150.37 -5.32 1.71 1.72 1.	66 27	6 0.19	0.00	0.09	-0.02	0.210	0.000	-0.094	0.001	-8.47	-5.46	2001.98	139.64			-5.41	142.14
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	67 27	7 0.18	0.00	0.08	-0.02	0.198	0.000	-0.084	0.004	-7.72	-5.21	2007.44	142.25			-5.18	144.73
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181 291 0.00 0.00 0.00 0.00 0.00 0.00 0.000 0.00 0.000 0.00 -5.98 10 173.60 -5.98 1 182 292 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.000 0.00 0.00 0.000 0.00 0.00 -6.32 -5.65 2094.62 176.14 -5.66 17 183 293 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.																	170.41
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185 295 0.00 0.01 0.00 0.000 -0.013 0.000 0.000 -4.98 -4.37 2106.96 188.02 -4.37 1 186 296 0.00 0.00 0.00 0.000 0.000 0.000 -4.23 -3.66 2111.73 191.33 -3.67 1 187 297 0.00 0.05 0.00 0.00 0.001 -0.067 0.001 0.002 -3.70 -2.74 2114.50 196.63 -2.72 1 188 298 0.00 0.05 0.00 0.001 0.013 -0.004 0.002 -2.85 -1.93 2118.97 200.22 -1.91 2 189 299 0.01 0.07 0.00 0.01 0.014 -0.107 0.002 -0.63 2121.92 205.35 -1.32 2 190 300 0.01 0.08 0.00 0.01 0.014 -0.107 0.000 -0.26 -0.235 -0.22	83 29	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-6.49	-5.81	2098.85	179.98			-5.81	182.79
186 296 0.00 0.00 0.00 0.000 0.000 0.000 0.000 -4.23 -3.66 2111.73 191.33 -3.67 187 297 0.00 0.05 0.00 0.001 -0.067 0.001 0.002 -3.70 -2.74 2114.50 196.63 -2.72 188 298 0.00 0.05 0.00 0.001 -0.067 0.001 0.002 -2.85 -1.93 2118.97 200.22 -1.91 22 189 299 0.01 0.07 0.00 0.01 0.013 -0.094 0.002 -0.007 -2.70 -1.36 2121.92 205.35 -1.32 2 190 300 0.01 0.01 0.014 -0.107 0.003 -0.006 -2.26 -0.68 2126.34 208.99 -0.63 2 191 301 0.03 0.09 -0.01 0.01 0.035 -0.122 0.015 -0.004 -2.34 -0.51 2129.51 213.90 -0.45 2 193 303 <td< td=""><td>84 29</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.000</td><td>0.000</td><td>0.000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-5.30</td><td>185.77</td></td<>	84 29	0.00	0.00	0.00	0.00	0.000	0.000	0.000								-5.30	185.77
187 297 0.00 0.05 0.00 0.00 0.001 -0.067 0.001 0.002 -3.70 -2.74 2114.50 196.63 -2.72 1 188 298 0.00 0.05 0.00 0.00 0.00 0.001 0.001 0.002 -0.067 0.001 0.002 -2.85 -1.93 2118.97 200.22 -1.91 2 189 299 0.01 0.07 0.00 0.01 0.01 0.013 -0.094 0.002 -0.007 -2.70 -1.36 2121.92 205.35 -1.32 2 190 300 0.01 0.08 0.00 0.01 0.01 0.014 -0.107 0.003 -0.006 -2.26 -0.68 2126.34 208.99 -0.63 2 191 301 0.03 0.09 -0.01 0.01 0.02 0.035 -0.122 0.015 -0.004 -2.34 -0.51 2129.51 213.90 -0.45 2 192 302 0.03 0.10 -0.01 0.02 0.036 -0.134 0.016 -0.013 -2.16 0.02 2133.90 217.58 0.13 2 193 303 0.34 0.00 0.07 -0.01 0.381 0.000 -0.035 -0.013 -0.97 0.04 2137.05 222.50 -0.02 2 194 304 0.23 0.00 0.01 -0.01 0.250 0.000 0.010 0.009 -0.48 0.05 2141.78 225.85 0.03 2 195 305 0.24 0.00 0.01 -0.01 0.262 0.000 0.012 0.009 -0.86 -0.28 2145.10 230.60 -0.31 2 196 306 0.24 0.00 0.02 -0.01 0.262 0.000 -0.001 0.006 -0.93 -0.31 2149.69 234.07 -0.33 2 197 307 0.24 0.00 0.02 -0.01 0.262 0.000 -0.007 -0.001 0.006 -1.37 -0.70 2152.91 238.93 -0.73 2 198 308 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -0.007 -2.08 -1.37 2160.64 247.34 -1.41 2 200 310 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -0.007 -2.80 -1.37 2160.64 247.34 -1.41 2 201 311 0.26 0.00 0.03 0.00 0.03 0.00 0.285 0.000 -0.007 -0.00																	
188 298 0.00 0.05 0.00 0.001 -0.067 0.001 0.002 -2.85 -1.93 2118.97 200.22 -1.91 2 189 299 0.01 0.07 0.00 0.01 0.013 -0.094 0.002 -0.007 -2.70 -1.36 2121.92 205.35 -1.32 2 190 300 0.01 0.08 0.00 0.01 0.014 -0.107 0.003 -0.006 -2.26 -0.68 2126.34 208.99 -0.63 2 191 301 0.03 0.09 -0.01 0.015 -0.012 0.004 -2.34 -0.51 2129.51 213.90 -0.45 2 192 302 0.03 0.10 -0.01 0.02 0.036 -0.134 0.016 -0.013 -2.16 0.02 2133.90 217.58 0.13 2 193 303 0.34 0.00 0.07 -0.01 0.381 0.000 -0.013																	
189 299 0.01 0.07 0.00 0.01 0.013 -0.094 0.002 -0.007 -2.70 -1.36 2121.92 205.35 -1.32 2 190 300 0.01 0.08 0.00 0.01 0.014 -0.107 0.003 -0.006 -2.26 -0.68 2126.34 208.99 -0.63 2 191 301 0.03 0.09 -0.01 0.01 0.035 -0.122 0.015 -0.004 -2.34 -0.51 2129.51 213.90 -0.45 2 192 302 0.03 0.10 -0.01 0.02 0.036 -0.134 0.016 -0.013 -2.16 0.02 2133.90 217.58 0.13 2 193 303 0.34 0.00 0.07 -0.01 0.381 0.000 -0.013 -0.97 0.04 2137.05 222.50 -0.02 2 194 304 0.23 0.00 0.01 0.262 0.000 0.012 0.009 -0.48 0.05 2141.78 225.85 0.03 2																	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	92 30	0.03	0.10	-0.01	0.02	0.036	-0.134	0.016	-0.013	-2.16	0.02	2133.90	217.58			0.13	221.09
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	93 30	0.34	0.00	0.07	-0.01	0.381	0.000	-0.035	-0.013	-0.97	0.04	2137.05	222.50			-0.02	225.93
$\begin{array}{cccccccccccccccccccccccccccccccccccc$																	
197 307 0.24 0.00 0.02 -0.01 0.262 0.000 -0.001 0.006 -1.37 -0.70 2152.91 238.93 -0.73 2 198 308 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -1.58 -0.87 2157.47 242.44 -0.90 2 199 309 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.08 -1.37 2160.64 247.34 -1.41 2 200 310 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.31 -1.55 2165.05 251.00 -1.59 2 201 311 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.80 -2.01 2168.01 256.11 -2.06 2 202 312 0.26 0.00 0.04 0.00 0.286 0.000 -0.019 -0.010 -2.97 -2.05 2172.10 260.09 -2.07 2																	
198 308 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -1.58 -0.87 2157.47 242.44 -0.90 24.199 309 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.08 -1.37 2160.64 247.34 -1.41 2.200 310 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.31 -1.55 2165.05 251.00 -1.59 2.201 311 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.80 -2.01 2168.01 256.11 -2.06 2.202 312 0.26 0.00 0.04 0.00 0.286 0.000 -0.019 -0.010 -2.97 -2.05 2172.10 260.09																	
199 309 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.08 -1.37 2160.64 247.34 -1.41 2 200 310 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.31 -1.55 2165.05 251.00 -1.59 2 201 311 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.80 -2.01 2168.01 256.11 -2.06 2 202 312 0.26 0.00 0.04 0.00 0.286 0.000 -0.019 -0.010 -2.97 -2.05 2172.10 260.09 -2.07 2																	
200 310 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.31 -1.55 2165.05 251.00 -1.59 2 201 311 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.80 -2.01 2168.01 256.11 -2.06 2 202 312 0.26 0.00 0.04 0.00 0.286 0.000 -0.019 -0.010 -2.97 -2.05 2172.10 260.09 -2.07 2																	
201 311 0.26 0.00 0.03 0.00 0.285 0.000 -0.007 -0.007 -2.80 -2.01 2168.01 256.11 -2.06 2 202 312 0.26 0.00 0.04 0.00 0.286 0.000 -0.019 -0.010 -2.97 -2.05 2172.10 260.09 2172.10 260.09 -2.07 2																	
		1 0.26			0.00	0.285	0.000	-0.007	-0.007	-2.80	-2.01	2168.01	256.11			-2.06	260.34
202 212 0 26 0 00 0 04 0 01 0 297 0 000 0 019 0 010 2 20 2 20 2174 70 265 57	02 31	2 0.26	0.00	0.04	0.00	0.286	0.000	-0.019	-0.010	-2.97	-2.05	2172.10	260.09			-2.07	264.46
	03 31		0.00	0.04	0.01	0.287											270.07
204 314 0.26 0.00 0.04 0.01 0.287 0.000 -0.018 -0.019 -3.09 -2.13 2178.43 269.91 -2.12 2	04 31	4 0.26	0.00	0.04	0.01	0.287	0.000	-0.018	-0.019	-3.09	-2.13	2178.43	269.91			-2.12	274.55

N	A	$arepsilon_2$	ϵ_3	ε_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 110	(Ds)															
	315	` /	0.00	0.05	0.00	0.287	0.000	-0.031	-0.013	-3.39	-2.32	2180.80	275.61			-2.33	280.36
206	316	0.25	0.00	0.05	0.00	0.276	0.000	-0.033	-0.012	-3.18	-2.09	2184.30	280.17			-2.08	285.07
	317		0.00		0.00							2186.64				-2.36	
	318		0.00		0.00							2190.16				-2.25	
	319		0.00		0.00				-0.018			2192.35				-2.56	301.72
210	320		0.00 0.00		0.00 0.00			-0.069 -0.069		-4.59 -4.99		2195.77 2197.91				-2.49 -2.91	306.58 312.65
	322		0.00		0.00			-0.069				2201.14					317.65
213	323	0.25	0.00	0.08	0.00	0.279	0.000	-0.069	-0.021	-5.23		2203.09				-3.22	323.92
214	324	0.24	0.00	0.08	0.00	0.267	0.000	-0.071	-0.020	-5.17	-3.21	2206.08	322.97			-3.06	329.19
	325		0.00		0.01				-0.026			2207.93					335.57
	326		0.00		0.02			-0.019				2210.74				-3.36	340.94
	327 328		0.00 0.00		0.02			-0.019		-4.75		2212.42 2215.33					347.50 352.84
	329		0.00		0.02							2216.96				-4.23	359.50
220	330	0.19	0.00	0.04	0.02			-0.031		-5.40		2219.66				-4.23	365.06
221			0.00		0.02				-0.027			2220.97				-4.51	372.00
	332		0.00		0.02				-0.027			2223.47				-4.44	377.77
	333		0.00		0.01							2224.79				-4.91	384.67
	334		0.00		0.01				-0.019			2227.19				-4.89	390.55
	335 336		0.00 0.00		0.00 0.00				-0.009 -0.009			2228.32 2230.52				-5.29 -5.20	397.65 403.73
	337		0.00		0.00			-0.048 -0.012		-6.98		2230.32				-5.20 -6.44	410.13
	338		0.00		0.00		0.000	0.000	0.000	-7.88		2235.33				-7.29	415.42
229	339	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-7.98	-7.39	2235.95	414.17			-7.39	423.09
Z	= 111	(Rg)															
	259	_	0.00	0.02	0.01	0.218	0.000	-0.006	-0.013	-3.21	-2.43	1857.78	145.85			-2.50	149.16
	260		0.00		0.02			-0.005		-3.87		1866.50				-2.97	148.45
150			0.00		0.02			-0.017				1876.40				-3.26	146.57
	262		0.00		0.02							1884.91					146.05
	263		0.00		0.02							1894.32				-3.86	144.66
	264 265		0.00 0.00		0.01				-0.018			1902.26 1911.40					144.74 143.63
	266		0.00		0.01							1919.16					143.88
	267		0.00		0.00							1927.99					143.08
157	268	0.20	0.00	0.06	0.00	0.220	0.000	-0.055	-0.013	-6.49	-4.81	1935.61	140.66			-4.86	143.48
	269		0.00		0.00							1944.33				-5.01	142.82
	270				-0.01							1951.83					143.34
	271272				-0.01 -0.01							1960.35 1967.58					142.87 143.68
	273				-0.01							1907.38					143.48
	274				-0.02			-0.093				1982.66					144.72
	275				-0.02			-0.093				1990.07					145.38
165	276	0.18	0.00	0.08	-0.02	0.198	0.000	-0.084	0.004	-8.68	-6.12	1996.16	144.68				147.34
	277				-0.02			-0.084				2003.26					148.31
	278				-0.01							2009.13					150.48
	279				-0.01			-0.063				2016.14					151.54
169 170	280 281		0.00 0.00		0.00 0.00							2022.35 2029.49					153.38 154.33
	282		0.00		0.00			-0.032				2035.51					156.38
	283		0.00		0.00							2042.45					157.52
173	284	0.09	0.00	0.03	0.00	0.097	0.000	-0.032	-0.003	-7.34	-6.38	2048.29	157.12			-6.38	159.76
	285				-0.01			-0.045	0.007			2055.00					161.15
	286				-0.01			-0.045				2060.56					163.68
	287 288				-0.01 -0.01			-0.045 -0.046	0.007 0.007			2066.77 2071.94					165.57 168.49
		-0.04				-0.042		0.001				2071.94					170.45
1/0	209	-0.04	0.00	0.00	0.00	-0.042	0.000	0.001	0.000	-7.08	-0.30	2078.03	107.72			-0.30	170.43

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β ₃	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 111	(Rg)															
		-0.03	0.00	0.00	0.00	-0.032	0.000	0.000	0.000	-7.47	-6.82	2083.15	170.70			-6.82	173.45
180	291	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-7.24	-6.57	2088.97	172.94			-6.57	175.74
		-0.01		0.00		-0.011	0.000	0.000	0.000			2093.78					179.03
182 183	293 294	0.00 0.00		0.00	0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000			2099.31 2103.81					181.61 185.23
	295	0.00		0.00	0.00	0.000	0.000	0.000	0.000			2108.96					188.19
	296	0.00		0.00	0.00	0.000	-0.013	0.000	0.000			2112.27				-5.14	193.01
186			0.00	0.00	0.00	0.000	0.000	0.000	0.000			2117.03					196.36
187		0.00		0.00	0.00		-0.054	0.001	0.001			2120.07				-3.44	201.47
188		0.00		0.00	0.00		-0.040	0.000	0.001			2124.55				-2.62	205.11
189 190		0.01		0.00	0.00		-0.081 -0.081	0.002	0.002 0.002			2127.68 2132.06				-1.91 -1.17	210.13 213.89
191			0.08	-0.01	0.01		-0.108	0.015	-0.005			2135.33				-0.77	218.78
192			0.08	-0.01	0.01		-0.108					2139.70					222.57
193		0.03		0.00	0.02		-0.134					2143.22				-0.21	227.24
194 195		0.34 0.24	0.00		-0.01	0.381 0.262	0.000	-0.035	-0.013 0.009			2147.72 2151.33				-0.11 -0.39	230.74 235.31
195		0.24			-0.01 -0.01	0.262	0.000	0.012 -0.001	0.009			2151.33				-0.39 -0.40	238.89
197		0.25			-0.01	0.273	0.000	0.002	0.007			2159.40				-0.77	243.55
198	309	0.26	0.00	0.03	-0.01	0.285	0.000	-0.008	0.003	-1.49	-0.85	2163.94	243.26			-0.89	247.18
199		0.27		0.03	0.00	0.297		-0.005				2167.41				-1.42	251.86
200		0.26		0.03	0.00	0.285			-0.007			2171.83				-1.59	255.63
201 202		0.26	0.00	0.03	0.00	0.285 0.286			-0.007 -0.010			2175.09 2179.17				-2.06 -2.05	260.54 264.66
	314		0.00	0.04	0.00	0.286						2182.00				-2.25	270.01
204	315	0.26	0.00	0.04	0.00	0.286	0.000	-0.019	-0.010	-2.85	-2.04	2185.74	269.88			-2.08	274.46
205			0.00	0.05	0.00	0.287						2188.43					279.98
206 207		0.25		0.05	0.00	0.276		-0.033				2191.90				-1.98	284.72 290.31
207		0.26 0.26		0.06	0.00 -0.01	0.288 0.289		-0.043 -0.056	-0.016 -0.009			2194.52 2198.00				-2.26 -2.12	295.06
209		0.26			-0.01	0.289		-0.056				2200.53				-2.49	300.73
210			0.00		-0.01	0.289		-0.068		-4.21		2203.86				-2.33	305.67
211			0.00		-0.01	0.289						2206.26					311.47
	323 324		0.00	0.08	-0.01 0.00	0.289 0.279						2209.48 2211.75				-2.64 -3.01	316.48
	325	0.19		0.03	0.00	0.279						2214.70					327.64
	326		0.00	0.03	0.01	0.207						2214.70				-2.93 -3.29	
216		0.18		0.02	0.02	0.196						2219.89				-3.35	
	328	0.18		0.03	0.02	0.196						2221.92				-3.76	
218		0.18		0.03	0.02	0.196						2224.79				-3.79	
219 220		0.18 0.18		0.03	0.02	0.196 0.197						2226.65 2229.22				-4.20 -4.11	
	332	0.18		0.04	0.01	0.197						2230.96				-4.11 -4.54	
	333	0.18		0.05	0.01	0.197						2233.59				-4.57	
223	334	0.18	0.00	0.05	0.01	0.197	0.000	-0.045	-0.019	-6.45	-5.13	2235.24	373.74			-5.05	381.37
224		0.05		0.02	0.00	0.054						2237.07				-4.53	
225		0.05		0.02	-0.01	0.053	0.000	-0.023				2238.94				-5.33	
	337 338	-0.01 0.02		0.00	0.00	-0.011 0.021	0.000	0.000 0.000				2242.03 2244.05				-6.16 -7.27	
	339		0.00	0.00	0.00	0.000	0.000	0.000				2247.09				-8.16	
\boldsymbol{z}	= 112	(Cn)															
	- 11 2 262		0.00	0.02	0.02	0.218	0.000	-0.005	-0.023	-3.53	-2.66	1875.59	151.47			-2.71	154.94
151	263	0.20	0.00	0.03	0.02	0.219	0.000	-0.017	-0.025	-4.14	-3.15	1884.10	151.04			-3.20	154.44
	264	0.22		0.04	0.01	0.241						1893.86				-3.30	
153 154		0.20		0.04	0.01	0.219 0.219						1901.83 1911.32				-3.50 -3.57	
	267		0.00	0.04	0.01	0.219						1911.32					151.25
133	207	0.19	0.00	0.04	0.01	0.208	0.000	-0.032	-0.016	— 4 .33	-5.62	1717.13	170.27			-5.01	131.40

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	eta_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 112	(Cn)															
157	268 269		0.00	0.05 0.05	0.00 0.00	0.208 0.208	0.000	-0.045	-0.010	-5.55	-4.27	1928.33 1935.98	147.58			-4.32	150.29 150.66
	270271		0.00	0.06	0.00	0.209		-0.057 -0.057				1945.05 1952.51				-4.47 -4.93	149.63 150.20
	272		0.00		-0.01	0.209						1961.42				-5.18	149.33
	273274		0.00		-0.01 -0.02	0.221 0.222		-0.080 -0.093	-0.007 0.000	-8.03 -8.75		1968.67 1977.29				-5.68 -5.86	150.11 149.56
	275		0.00		-0.02	0.222		-0.093	0.000			1984.07				-6.12	150.82
	276277		0.00 0.00		-0.02 -0.02	0.210 0.198		-0.094 -0.084	0.001 0.004			1991.96 1998.13				-5.82 -5.71	151.00 152.87
	278 279		0.00		-0.01	0.187		-0.072				2005.54 2011.65					153.51 155.45
	280		0.00	0.06 0.04	-0.01 0.00	0.175 0.141	0.000	-0.062 -0.041	-0.001 -0.006			2011.03				-5.24 -5.09	155.45
169			0.00	0.00	0.01	0.085	0.000					2025.50					157.72
	282 283		0.00	0.01	0.01	0.086		-0.009 -0.009				2033.11 2039.21				-5.68 -6.16	158.18 160.15
172	284	0.08	0.00	0.02	0.00	0.086		-0.021		-7.00	-6.19	2046.49	158.14			-6.20	160.93
	285 286		0.00	0.03	0.00 -0.01	0.086 0.075		-0.033 -0.034	-0.003 0.008	-7.61 -7.61		2052.34 2059.36				-6.63 -6.61	163.16 164.23
175	287		0.00		-0.01	0.075		-0.046	0.007	-8.20		2064.93				-6.97	166.75
	288 289		0.00	0.03 0.01	-0.01 0.00	0.064 0.043	0.000 0.000	-0.034 -0.011	0.008 -0.000			2071.54 2076.86				-6.76 -7.11	168.23 170.97
	290		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2083.50					172.42
	291 292	-0.01	0.00	0.00	0.00	-0.011 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-8.21 -8.00		2088.66 2094.83					175.37 177.29
	292		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-8.00 -8.29		2094.83				-7.27 -7.55	180.52
182	294		0.00	0.00	0.00	0.000	0.000	0.000	0.000		-7.19	2105.55	179.80			-7.20	182.78
	295 296		0.00	0.00	0.00 0.00	0.000 0.000	0.000 0.000	0.000	0.000 0.000	-8.01 -7.45		2110.04 2115.50				-7.29 -6.75	186.40 189.05
	297	0.00		0.00	0.00	0.000	-0.013	0.000	0.000	-6.50		2118.80				-5.83	193.87
	298 299		0.00 0.02	0.00	0.00	0.000 0.011	0.000 -0.027	0.000 0.000	0.000 0.000	-5.74 -4.63		2123.89 2126.78				-5.12 -3.98	196.90 202.13
188	300	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.78	-3.25	2131.67	202.11			-3.25	205.37
	301 302		0.03	0.00	0.00 0.00		-0.040 -0.013	0.000 0.000				2134.56 2139.25					210.61 214.04
	303			-0.01	0.01		-0.094					2142.33					219.14
	304			-0.01	0.01		-0.094					2146.97					222.65
	305 306			-0.01 -0.04	0.02 -0.02	0.046	-0.121 0.000	0.016		-2.00 -0.53		2150.15 2154.73					227.65 231.24
195	307	0.49	0.00	0.00	0.02	0.551	0.000	0.116				2160.97				-2.68	232.89
	308 309		0.00		-0.01 -0.01	0.284 0.285	0.000	0.016 0.004				2163.56 2167.07					238.58 243.21
	310		0.00		-0.01	0.285	0.000	0.004	0.007	-1.10	-0.71	2171.88	242.61				246.57
	311 312		0.00	0.03	0.00 0.00	0.308 0.297						2175.32 2180.01					251.27 254.77
	313		0.00	0.03	0.00	0.297						2183.26					259.68
202	314	0.27	0.00	0.03	0.00	0.297	0.000	-0.005	-0.007	-2.30	-1.78	2187.65	259.13			-1.83	263.48
	315 316		0.00 0.00	0.04 0.04	0.00	0.298 0.286						2190.44 2194.44					268.86 273.06
205	317	0.26	0.00	0.05	0.00	0.287						2197.04				-1.86	278.65
	318 319		0.00	0.05	$0.00 \\ -0.01$	0.287 0.288						2200.87 2203.42					283.03 288.68
	320		0.00		-0.01	0.289						2203.42 2207.18				-1.64 -1.67	
	321 322		0.00		-0.01 -0.01	0.289 0.289						2209.71					298.82
	323		0.00		-0.01	0.289						2213.32 2215.73					303.47 309.25
212			0.00		-0.01	0.289						2219.19					314.02

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	$M_{\rm exp}$ (MeV)	$\sigma_{\rm exp}$ (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{\rm th}^{\rm FL}$ (MeV)
Z:	= 112	(Cn)															
	325	` /	0.00	0.03	0.01	0.207	0.000	-0.020	-0.015	-3.29	-2.50	2221.35	314.21			-2.48	320.00
	326		0.00	0.02	0.01	0.195		-0.010				2224.76				-2.49	324.79
	327		0.00	0.03	0.01	0.196		-0.022				2226.91				-2.88	330.89
	328 329		0.00 0.00	0.02	0.01	0.184 0.184		-0.011 -0.011				2230.33 2232.31				-3.05 -3.43	335.68 341.93
	330		0.00	0.02	0.01	0.185		-0.023				2235.52				-3.50	346.97
219			0.00	0.03	0.01	0.185		-0.023		-4.26 -4.69		2237.23				-3.75	353.50
	332		0.00	0.03	0.01	0.185		-0.023				2240.21				-3.76	358.76
	333		0.00	0.04	0.01	0.185		-0.035		-5.33		2241.99				-4.18	365.26
	334		0.00	0.04	0.01	0.185		-0.035				2244.87				-4.22	370.63
	335		0.00	0.02	0.00	0.054		-0.023		-4.93		2246.26				-4.48 5.01	377.44
224	336 337		0.00 0.00	0.01	0.00 0.00	0.053 0.021	0.000 0.000	-0.011 0.000	-0.001	-5.45 -6.38		2249.48 2251.39				-5.01 -5.88	382.47 388.82
	338		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2254.92				-6.84	393.56
227	339	0.01	0.00	0.01	0.00	0.011	0.000	-0.012	-0.000	-8.56	-7.95	2256.95	391.61			-7.95	399.80
\boldsymbol{Z} :	= 113																
153	266	0.19	0.00	0.03	0.02	0.207	0.000	-0.019	-0.025	-4.08	-3.10	1899.59	158.98			-3.16	162.53
154			0.00	0.03	0.01	0.196		-0.022				1909.13				-3.25	161.01
	268		0.00	0.05	0.00	0.208		-0.045				1917.26					160.88
	269 270		0.00 0.00	0.05 0.05	0.00 0.00	0.197 0.197		-0.046 -0.046				1926.58 1934.60				-3.00 -4.10	159.58 159.58
158			0.00	0.06	0.00	0.198			-0.012			1943.69				-4.25	158.52
	272		0.00	0.06		0.197		-0.059		-6.29		1951.56				-4.77	158.68
	273	0.19	0.00		-0.01	0.209		-0.070		-6.87		1960.47				-5.00	157.80
	274		0.00		-0.01	0.210		-0.082				1968.06				-5.49	158.24
	275		0.00		-0.02	0.209		-0.083	0.003	-8.10		1976.71				-5.69	157.64
163 164	276		0.00 0.00		-0.02 -0.02	0.210 0.198		-0.094 -0.084	0.001 0.004	-8.95 -8.26		1983.92 1991.91				-6.04 -5.82	158.47 158.53
	278		0.00	0.09	-0.02	0.198	0.000		0.004	-8.20 -8.71		1998.44				-5.62	160.07
	279	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-6.30		2006.50				-5.82	160.05
167	280	0.05	0.00	-0.01	0.00	0.053	0.000	0.013	0.001	-6.61	-5.93	2013.01	158.55			-5.93	161.58
168				-0.01	0.00	0.064	0.000	0.014	0.001	-6.71		2020.81				-6.01	161.84
	282 283		0.00	-0.01 0.00	0.01	0.064 0.075	0.000 0.000			-7.20		2027.42 2034.99					163.29 163.78
	284		0.00	0.00	0.01	0.075						2041.39					165.45
	285		0.00	0.01	0.00	0.075						2048.67					166.23
173	286	0.07	0.00	0.02	0.00	0.075	0.000	-0.022	-0.002	-8.25	-7.40	2054.84	165.15			-7.40	168.13
174			0.00	0.02	0.00	0.064		-0.022				2061.86					169.18
	288		0.00	0.02	0.00	0.054		-0.023				2067.75					171.37
	289 290		0.00 0.00	0.01	0.00 0.00	0.043 0.032		-0.011 -0.012				2074.49 2080.25					172.71 175.03
	291	-0.02		0.00	0.00	-0.021	0.000	0.000	0.000			2086.85					176.52
	292		0.00	0.00	0.00	0.021	0.000					2092.28					179.18
180	293	0.02	0.00	0.01	0.00	0.021	0.000	-0.012	-0.000	-8.88	-8.08	2098.42	178.08			-8.08	181.14
	294		0.00	0.00	0.00	0.011	0.000	0.000	0.000			2103.53					184.12
	295		0.00	0.00	0.00	0.011	0.000	0.000	0.000			2109.35					186.40
	296		0.00 0.00	0.00	0.00	0.011	0.000	0.000	0.000			2114.14					189.72
	297 298		0.00	0.00	0.00 0.00	0.000 0.000	0.000 -0.013	0.000 0.000	0.000 0.000			2119.60 2123.20					192.37 196.87
	299		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2128.32					199.87
187	300	0.01	0.01	0.00	0.00	0.011	-0.013	0.000	0.000	-5.26	-4.64	2131.52	201.46			-4.64	204.78
188			0.00	0.00	0.00	0.011	0.000	0.000	0.000			2136.42				-3.91	
	302		0.01	0.00	-0.01		-0.014	0.000	0.010			2139.61				-2.93	
	303 304		0.00	0.01 -0.01	0.00 0.00	0.011	0.000 -0.041	-0.012 0.013	-0.000 0.001			2144.34 2147.56					216.34 221.25
	305			-0.01 -0.02	0.00		-0.041 -0.068	0.013	0.001			2152.20					221.23
	306			-0.04			-0.014	0.051				2155.69					229.48
		0.07	5.51		0.02		J.U1 F	3.031	J.023	1.50						0.17	

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 113																
194	307	0.08	0.00	-0.04	-0.02	0.086	0.000	0.051	0.025	-1.17	-0.19	2160.40	229.09			-0.10	232.92
195				-0.04		0.097		0.052	0.026	-1.09		2163.90				0.02	237.57
196				-0.04			0.000	0.053	0.016	-0.75		2168.57				0.21	241.01
197 198		0.48	0.00	0.02	0.01 -0.01	0.541	0.000	0.085	0.001	-2.14 -1.04		2175.32 2177.65				-3.42 -0.83	242.09 248.12
199 200			0.00 0.00	0.03	0.00		0.000 0.000		-0.006 -0.003	-1.55 -1.66		2181.39 2186.06				-1.31 -1.42	252.52 256.02
201		0.27		0.02	0.00		0.000		-0.007			2189.58				-1.84	260.66
202	315	0.27	0.00	0.03	0.00	0.297	0.000		-0.007		-1.80	2193.98	260.08			-1.85	264.44
203	316	0.27	0.00	0.04	0.00	0.298	0.000	-0.017	-0.010	-2.52	-1.92	2197.05	265.08			-1.98	269.55
204		0.27	0.00	0.04	0.00	0.298	0.000	-0.017	-0.010	-2.26	-1.71	2201.05	269.15			-1.75	273.73
205		0.26		0.04	0.00				-0.010			2203.94				-1.86	279.02
206 207		0.26	0.00	0.05	0.00 -0.01				-0.013			2207.73 2210.54				-1.57 -1.75	283.44 288.82
207			0.00		-0.01							2214.28				-1.73 -1.59	293.29
209		0.26			-0.01					-3.21		2217.08				-1.90	298.70
210		0.26			-0.01		0.000			-3.21 -3.06		2220.62				-1.69	303.38
211			0.00		-0.01				-0.012			2223.34				-2.06	308.89
212	325	0.26	0.00	0.08	-0.01	0.289	0.000	-0.068	-0.012	-3.85	-2.14	2226.94	307.84			-2.07	313.51
213	326	0.17	0.00	0.01	0.02	0.184	0.000	0.002	-0.021	-3.14	-2.44	2229.40	313.44			-2.40	319.22
214			0.00	0.01	0.02	0.173	0.000	0.000	-0.021	-3.10		2232.83				-2.39	324.02
215			0.00	0.02	0.01				-0.013			2235.20				-2.79	329.81
216 217			0.00	0.02	0.01			-0.013 -0.013	-0.013	-3.57 -3.98		2238.57 2240.84				-2.87 -3.28	334.67 340.61
217		0.16		0.02	0.01				-0.013			2244.03				-3.28 -3.33	345.66
219			0.00	0.02	0.01				-0.013			2246.12				-3.68	351.80
220			0.00	0.02	0.01			-0.013 -0.024		-4.52		2249.17				-3.08 -3.72	357.01
221			0.00	0.03	0.01			-0.024		-4.94		2251.19				-4.15	363.23
222		0.07	0.00	0.03	-0.01			-0.034	0.008	-5.01			361.26			-4.33	368.45
223	336	0.05	0.00	0.02	0.00	0.054	0.000	-0.023	-0.001	-5.70	-5.22	2256.53	367.02			-5.21	374.36
224		0.05		0.01	0.00		0.000	-0.011		-6.23		2259.78				-5.76	379.35
225 226			0.00	0.00	0.00		0.000	0.000	0.000	-7.18		2261.97				-6.64	385.41 390.15
220	339	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	-8.18	-7.38	2265.49	362.29			-7.58	390.13
$oldsymbol{Z}$:	= 114	(Fl)															
155		0.18		0.03	0.01							1916.58				-3.09	169.14
156 157		0.17 0.17		0.04	0.00							1926.23 1934.24				-3.20 -3.60	167.51 167.50
157		0.17		0.04	0.00							1934.24				-3.00 -3.74	166.10
159		0.18			-0.01							1951.52				-4.23	166.27
160	274	0.18	0.00	0.07	-0.01	0.198	0.000	-0.071	-0.004	-6.23	-4.38	1960.74	161.61			-4.42	165.08
161		0.18			-0.01							1968.37					165.47
162		0.19			-0.02			-0.083				1977.30				-5.06	164.59
163		0.18			-0.02			-0.084				1984.59					165.33
164		0.00		0.00	0.00	0.000		0.000				1993.83					164.15
165		0.00		0.00	0.00	0.000		0.000				2000.77				-6.44	165.25
166 167		0.00 0.00		0.00	0.00	0.000 0.000		0.000 0.000				2009.21 2015.85				-6.59 -6.81	164.85 166.25
168		0.00		0.00	0.00	0.000		0.000				2023.88				-6.78	166.28
169				-0.01	0.01	0.064						2030.13				-6.83	168.08
170	284	0.06	0.00	-0.01	0.01	0.064	0.000	0.014	-0.009	-7.64	-6.86	2037.98	165.09			-6.86	168.29
171	285	0.06		0.00	0.01	0.064	0.000					2044.36				-7.26	169.96
172			0.00	0.01	0.00		0.000					2051.93				-7.24	170.45
173			0.00	0.01	0.00		0.000		-0.001			2058.11					172.34
	288	-0.02				-0.021						2065.62					172.90
		-0.02				-0.021						2071.58				-8.19	175.01
176		-0.01 0.01		0.00	0.00	-0.011 0.011		0.000 0.000				2078.82 2084.47					175.84 178.27
	271	0.01	0.00	0.00	0.00	0.011	0.000	0.000	0.000	2.34	0.50	2007.4/	173.10			0.37	170.27

$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$M_{\rm th}^{\rm FL}$ 7) (MeV)
178 292 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.945 8.88 2091.52 176.12 8.81 179 293 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.945 8.88 2091.52 176.12 8.81 179 295 0.00 0.00 0.000	
180 294	9 179.31
181 295 0.00 0.00 0.00 0.00 0.00	
182 296 0.00 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.926 -8.48 2114.66 185.26 -8.88 2898 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.929 -8.51 2119.43 188.57 -8.88 298 0.00 0.01 0.00 0.000 0.000 0.000 0.000 0.000 0.000 -8.69 -9.42 125.19 190.88 -7.88 299 0.00 0.01 0.00 0.00 0.000 0.577 -5.11 2137.39 202.89 -5.88 302 0.00 0.00 0.00	
183 297 0.00 0.00 0.00 0.00 0.000 0.000 -9.29 -8.51 2119.43 188.57 -8 184 298 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 -7.73 -7.01 2128.59 195.34 -7.7 185 300 0.00	
184 298 0.00 0.00 0.00 0.00 0.0000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.00	
186 300 0.00 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.577 5.11 2137.39 202.89 5.51	
187 301 0.01 0.01 0.00 0.00 0.001 0.001 0.000 0.00	
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225 339 0.01 0.00 0.00 0.00 0.011 0.000 0.000 0.000 -7.61 -7.03 2273.53 373.46 -7.03	381.04
Z = 115	
	3 177.11
	175.70
	5 175.55 5 174.32
	5 174.37
	5 173.40
	3 173.57
164 279 -0.01 0.00 0.00 0.00 -0.011 0.000 0.000 0.000 -6.72 -6.20 1993.09 168.83 -6.	172.42

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 115																
165		0.02	0.00	-0.01	0.00	0.021	0.000	0.012	0.000	-7.11	-6.48	2000.36	169.64			-6.48	173.19
166				-0.01	0.00	0.032	0.000	0.012	0.000			2008.73					172.86
167 168				-0.02 -0.02	0.00	0.064 0.064	0.000 0.000	0.025	0.002 -0.008			2015.79 2023.97					173.84 173.71
169				-0.02 -0.01	0.01	0.064	0.000		-0.008 -0.009			2030.94					174.78
170				-0.01	0.01	0.064	0.000	0.014	-0.009			2038.81					174.97
171		0.07	0.00	0.00	0.01	0.075	0.000		-0.010			2045.51				-7.80	176.32
172			0.00	0.00	0.01	0.064	0.000					2053.07					176.81
173 174		0.06		0.01	0.00	0.064 0.064	0.000 0.000	-0.010 -0.010				2059.55 2066.87					178.40 179.13
175		0.05		0.01	0.00	0.053	0.000	-0.011				2073.10					180.97
		-0.04		0.00		-0.042	0.000	0.001	0.000	-9.14		2080.43				-8.56	181.72
		-0.04		0.00		-0.042	0.000	0.001	0.000			2086.46				-8.93	183.76
		-0.02 -0.02		0.00		-0.021 -0.021	0.000 0.000	0.000	0.000			2093.35 2099.11					184.94 187.26
		-0.02 -0.02		0.00		-0.021	0.000	0.000	0.000			2105.57					188.89
		-0.02 -0.01		0.00		-0.021 -0.011	0.000	0.000	0.000			2110.99					191.56
		-0.01		0.00	0.00	-0.011	0.000	0.000	0.000			2117.12				-8.61	193.51
		-0.01		0.00		-0.011	0.000	0.000	0.000	-9.41		2122.22				-8.65	196.51
184		0.00		0.00	0.00	0.000	0.000	0.000	0.000			2127.97					198.86
185 186		0.00 0.00		0.00	0.00	0.000 0.000	-0.013 0.000	0.000 0.000	0.000 0.000			2131.90 2137.34				-7.11 -6.41	203.03 205.69
187		0.01		0.00	0.00	0.011	-0.013	0.000	0.000			2140.85				-5.26	210.28
188		0.01		0.00	0.00	0.011	0.000	0.000	0.000			2146.09					213.16
189		0.02		-0.01	0.00	0.021	-0.014	0.012	0.000			2149.59					217.77
190 191	305	-0.01		0.00 -0.02	0.00	-0.011	0.000 -0.068	0.000	0.000			2154.67 2158.23				-2.87 -2.12	220.81 225.38
191				-0.02 -0.02	0.00		-0.068	0.026 0.026	0.003	-3.20 -2.61		2163.27				-2.12 -1.58	223.38
193				-0.02	0.00		-0.082	0.027	0.004	-2.45	-1.26	2167.04	228.96			-1.23	232.83
194	309			-0.03	0.00	0.076	-0.069	0.039	0.005	-1.93	-0.85	2172.02	232.05			-0.81	235.99
195				-0.05	-0.01	0.086	0.000	0.064	0.016			2175.79				-0.62	240.39
196 197			0.00	-0.05 0.01	-0.01 0.01	0.097 0.552	0.000 0.000	0.064 0.102	0.017 0.009	-1.64		2180.73 2187.64					243.59 244.50
	313			0.01		0.552	0.000					2192.57					247.75
199	314	0.29	0.00	0.02	0.00	0.319	0.000	0.012	-0.003	-1.26	-1.33	2194.03	250.39			-1.42	254.57
	315	0.28		0.02	0.00	0.308	0.000					2198.95					257.82
201 202	316	0.27 0.28		0.02	0.00	0.296 0.308	0.000					2202.70 2207.37				-1.80 -1.78	
202		0.28		0.03	0.00	0.308						2210.70					270.54
204	319	0.27	0.00	0.03	0.00	0.297	0.000	-0.005	-0.007	-1.72	-1.52	2214.95	269.83			-1.58	274.47
205		0.27		0.04	0.00	0.298						2218.09					279.49
206		0.27 0.27			-0.01	0.298						2222.12				-1.29	
207 208		0.27			-0.01 -0.01	0.298 0.299						2225.24 2229.18				-1.48 -1.20	288.71 292.98
209		0.27			-0.01	0.299						2232.11				-1.38	
210	325	0.14	0.00	-0.01	0.02	0.150	0.000					2236.02				-1.19	302.56
211				-0.01	0.02	0.150	0.000					2238.98					307.79
212 213		0.14 0.14		0.00	0.02	0.151 0.151	0.000 0.000					2242.92 2245.75				-1.59 -1.96	
214			0.00	0.00	0.02	0.151						2249.61				-1.90 -2.10	
215		0.14		0.01	0.02	0.151						2252.32					327.26
216	331	0.11	0.00	0.02	0.01	0.119	0.000	-0.018	-0.012	-3.23	-2.66	2256.00	325.63			-2.64	331.75
217		0.11		0.02	0.01	0.119						2258.57					337.39
218 219	333	0.11		0.03	0.00	0.119 0.119						2262.18 2264.64				-3.24 -3.67	342.00 347.76
220		0.09			-0.01	0.097		-0.033				2268.19					352.46
221		0.09			-0.01	0.097		-0.033				2270.61					358.26

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 115																
222	337	0.05	0.00	0.01	0.00	0.053	0.000	-0.011	-0.001	-5.41	-4.96	2274.19	355.88			-4.96	362.88
223		0.05		0.02	0.00	0.054	0.000	-0.023	-0.001	-6.34		2276.78				-5.80	368.53
224	339	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-6.90	-6.34	2280.30	365.91			-6.35	373.24
$oldsymbol{Z}$:	= 116	(Lv)															
159		0.16			-0.01	0.174		-0.050	0.001			1948.99					183.94
160		0.17				0.186	0.000	-0.061	-0.001	-5.02		1958.60				-3.71	182.34
161 162		0.17 0.00		0.07 0.00	-0.02 0.00	0.186 0.000	0.000 0.000	-0.074 0.000	0.007 0.000	-5.97 -5.21		1966.58 1976.31				-4.20 -4.75	182.38 180.71
163		0.03		0.00	0.00	0.032	0.000	0.000	0.000	-5.76			177.11			-5.23	181.00
164		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-6.35		1993.53				-5.83	179.54
165			0.00		0.00	0.032	0.000	0.012	0.000	-6.73		2000.80				-6.08	180.30
166			0.00		0.00	0.053	0.000	0.025	0.001	-6.97		2009.51				-6.15	179.62
167		0.06	0.00	-0.02	0.01	0.064	0.000	0.026	-0.008	-7.51	-6.63	2016.78	176.65			-6.63	180.40
168	284	0.06	0.00	-0.02	0.01	0.064	0.000	0.026	-0.008	-7.61	-6.73	2025.29	176.21			-6.73	179.92
169		0.07	0.00	-0.01	0.01	0.075	0.000	0.014	-0.009	-7.98		2032.30				-7.19	180.95
170			0.00		0.02	0.075	0.000		-0.019	-8.13	-7.21	2040.50				-7.20	180.81
171		0.07		0.00	0.01	0.075	0.000		-0.010	-8.38		2047.22				-7.61	182.12
172 173		0.07 0.07		0.00	0.01	0.075 0.075	0.000 0.000		-0.010 -0.001	-8.29 -8.65		2055.08 2061.56				-7.52 -7.89	182.32 183.89
174 175		0.06		0.02	0.00 0.00	0.064 0.064	0.000 0.000	-0.022 -0.022	-0.001 -0.001	-8.63 -8.97	-7.77	2069.17 2075.39				-7.77 -8.10	184.34 186.18
	292	-0.07		0.02	0.00	-0.004	0.000	0.002	-0.001	-8.77		2083.10				-8.31	186.53
		-0.06		0.00	0.00	-0.063	0.000	0.001	0.000	-9.14		2089.10				-8.63	188.60
178		-0.04		0.00	0.00		0.000	0.001	0.000	-9.08		2096.22				-8.45	189.56
179	295	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-9.39	-8.65	2101.90	188.39			-8.66	191.95
180	296	-0.01	0.00	0.00	0.00	-0.011	0.000	0.000	0.000	-9.08	-8.32	2108.64	189.72			-8.32	193.29
181		0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-9.27			192.35			-8.49	195.94
182		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.84		2120.53				-8.07	197.57
183		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.86		2125.63				-8.10	200.56
184		0.00		0.00	0.00	0.000	0.000	0.000	0.000	-8.24		2131.70				-7.51	202.58
185 186		0.00		0.00 0.00	0.00 0.00	0.000 0.000	-0.013	0.000	0.000	-7.30 -6.53		2135.66 2141.41				-6.59 -5.88	206.71 209.06
187		0.00		0.00	0.00		0.000 -0.027	0.000 0.000	0.000 0.000			2141.41					213.65
188			0.00	0.00	0.00	0.000	0.000	0.000				2150.50					216.17
189				-0.01	0.00		-0.041	0.013				2153.98				-3.00	
190				-0.02	0.00		-0.068	0.026	0.003			2159.39					223.53
191	307	-0.04			0.00	-0.042	0.000		-0.001			2163.00					228.02
192		0.05	0.07	-0.02	0.01		-0.095	0.027				2168.64				-1.35	230.54
193	309	0.06	0.07	-0.02	0.01	0.066	-0.095	0.027	-0.005	-2.59	-1.14	2172.51	230.77			-1.11	234.77
194				-0.03	0.00		-0.083	0.040				2177.80					237.62
195				-0.05		0.086	0.000	0.064				2181.46					242.12
196				-0.05		0.097	0.000	0.064				2186.73 2190.54					244.99
197 198				-0.05 -0.05	0.00	0.108 0.107	0.000 0.000	0.065 0.065				2190.34					249.31 252.24
199 200		0.49 0.28		0.02	0.01	0.553 0.308	0.000 0.000	0.090	0.003 -0.003			2203.08 2205.73					252.74 258.42
201		0.28		0.02	0.00	0.308	0.000		-0.003			2209.51					262.77
202		0.28		0.02	0.00	0.308	0.000					2214.47					265.98
203	319	0.28	0.00	0.03	0.00	0.308	0.000	-0.002	-0.006	-1.82	-1.75	2217.82	266.18			-1.81	270.78
204	320	0.28	0.00	0.03	0.00	0.308	0.000	-0.002	-0.006	-1.46	-1.42	2222.30	269.77			-1.48	274.46
205	321	0.27	0.00	0.04	0.00	0.298	0.000	-0.017	-0.010	-1.68	-1.41	2225.39	274.75			-1.46	279.54
206		0.27		0.04	0.00	0.298			-0.010			2229.72				-1.13	283.39
207		0.27			-0.01	0.298			-0.003			2232.81					288.47
208		0.27			-0.01	0.299			-0.007			2237.02					292.47
209		0.27			-0.01	0.299			-0.007			2239.98					297.67
210 211		0.22		0.02 -0.01	0.01	0.240 0.139	0.000					2244.13 2247.09					301.71 306.99
	341	0.13	0.00	0.01	0.02	0.137	0.000	0.020	0.010	1.00	1.32	<i>22</i> ₹1.07	301.70			1.20	

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 116	(Lv)															
212		` ′	0.00	0.00	0.02	0.140	0.000	0.008	-0.020	-1.88	-1.27	2251.20	305.44			-1.22	311.07
	329		0.00	0.00	0.02	0.140	0.000		-0.020	-2.26		2254.02				-1.57	316.44
	330		0.00	0.01	0.01	0.118		-0.007				2258.23				-1.82	320.39
215	331	0.11	0.00 0.00	0.02	0.01	0.119 0.119		-0.018 -0.018				2260.98 2265.00				-2.23 -2.40	325.85 330.04
	333							-0.018									
	334		0.00 0.00	0.02	0.01	0.119 0.119		-0.018 -0.031				2267.58 2271.46				-2.81 -2.99	335.65 339.98
	335		0.00	0.03	0.00	0.119		-0.031		-4.11		2273.93				-3.43	345.73
220	336	0.09	0.00	0.03	-0.01	0.097	0.000	-0.033	0.007	-4.42	-3.77	2277.80	343.41			-3.73	350.09
221	337	0.09	0.00	0.03	-0.01	0.097	0.000	-0.033	0.007	-5.00	-4.32	2280.24	349.04			-4.29	355.87
	338		0.00	0.01	0.00	0.053		-0.011		-5.09		2283.97				-4.65	360.33
223	339	0.05	0.00	0.02	0.00	0.054	0.000	-0.023	-0.001	-6.04	-5.51	2286.58	358.84			-5.50	365.96
\boldsymbol{Z}	= 117																
	278		0.00	0.00	0.00	0.075	0.000	0.002	0.000			1964.76				-4.26	191.82
	279		0.00	0.00	0.00	0.043	0.000	0.001	0.000			1974.38				-4.71	190.21
	280 281		0.00 0.00	0.00	0.00	0.043	0.000 0.000	0.001	0.000 0.000			1982.53 1992.01				-5.28 -5.84	190.08 188.62
	282			-0.00	0.00	0.000	0.000	0.000	0.000			1992.01				-6.11	189.03
	283			-0.01	0.00	0.064	0.000	0.014	0.001			2008.43				-6.24	188.26
	284			-0.01	0.00	0.004	0.000	0.014	-0.001	-7.46						-6.71	188.70
	285			-0.01	0.01	0.075	0.000	0.014	-0.009	-7.61	-6.84	2024.58	184.21			-6.84	188.17
	286			-0.01	0.01	0.075	0.000		-0.009	-8.07		2031.91				-7.30	188.88
170	287	0.07	0.00	0.00	0.01	0.075	0.000	0.002	-0.010	-8.09	-7.34	2040.16	184.77			-7.34	188.67
171			0.00	0.01	0.01	0.086		-0.009				2047.23				-7.76	189.64
172	289 290		0.00 0.00	0.01 0.02	0.01	0.075 0.075		-0.010 -0.022	-0.011 -0.002	-8.49 -8.94		2055.13 2061.96				-7.68 -8.08	189.79 191.01
173			0.00	0.02	-0.00	0.075		-0.022 -0.034	0.002	-8.94 -9.03						-8.08 -7.98	191.01
	292		0.00	0.03	-0.01	0.075		-0.034	0.008	-9.34		2076.14				-8.29	192.95
176	293	-0.07	0.00	0.00	0.00	-0.073	0.000	0.002	-0.000	-8.84	-8.40	2083.77	189.59			-8.41	193.37
177		-0.07		0.01	0.00	-0.073	0.000	-0.010	0.001	-9.23	-8.73	2090.11	191.33			-8.74	195.09
		-0.05		0.00		-0.052	0.000	0.001	0.000	-9.07		2097.18				-8.50	196.09
179		-0.03 -0.03		0.00		-0.032 -0.032	0.000	0.000 -0.011	0.000 0.000	-9.33		2103.12 2109.89				-8.65 -8.31	198.22 199.53
	298 299		0.00	0.00	0.00	0.000	0.000	0.000 0.000	0.000			2115.55 2122.01				-8.39 -7.96	201.95 203.57
	300		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2127.41					206.25
184			0.00	0.00	0.00	0.000	0.000	0.000	0.000			2133.49					208.25
185	302	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-7.17	-6.47	2137.77	208.23			-6.47	212.06
	303		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2143.53					214.40
	304		0.02	0.00	0.00	0.011	-0.027	0.000	0.000			2147.38					218.64
	305 306	-0.00	0.00	0.00 -0.01	0.00	0.000 -0.032	0.000 0.000	0.000 0.012	0.000 -0.000			2152.95 2156.75					221.17 225.48
	307		0.00	0.00	0.00	0.000	0.000	0.012				2162.15					228.18
		-0.39		0.05		-0.397	0.000	0.004	0.020			2166.40					231.85
	309		0.08	-0.01	0.01	0.066	-0.108	0.016				2172.17					234.42
		-0.40		0.05	0.00	-0.407	0.000	0.006	0.011			2176.16					238.29
		-0.40		0.04		-0.406	0.000	0.016				2181.42					241.16
		-0.40		0.04		-0.406	0.000	0.016				2185.56					245.13
		-0.41		0.04		-0.416	0.000	0.020	0.007			2190.77					248.05
	314 315		0.00 0.00	0.00	0.01	0.539 0.552	0.000 0.000	0.109 0.102	0.014 0.009			2198.53 2203.76					248.42 251.32
	316		0.00	0.01	0.01	0.552	0.000	0.102	0.009			2207.88					255.30
	317		0.00	0.02	0.00	0.319	0.000		-0.003			2210.51					260.99
201	318	0.28	0.00	0.02	0.00	0.308	0.000	0.010	-0.003	-1.76	-1.86	2214.47	260.67			-1.95	265.17
202	319		0.00	0.02	0.00	0.308	0.000	0.010	-0.003	-1.74	-1.84	2219.44	263.77			-1.91	268.36
	320		0.00	0.03	0.00	0.308						2223.04					272.90
204	321	0.28	0.00	0.03	0.00	0.308	0.000	-0.002	-0.006	-1.51	-1.57	2227.56	2/1.80			-1.64	276.55

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 117																
	322		0.00	0.04	-0.01	0.309	0.000	-0.016	-0.000	-1.63	-1.53	2230.91	276.52			-1.61	281.35
	323	-0.45		0.04	0.00	-0.454	-0.021	0.032	0.005	-2.25		2233.93				-0.16	286.30
207	324	0.28	0.01	0.05	-0.01	0.310	-0.013	-0.028	-0.004	-1.52	-1.28	2238.54	285.03			-1.35	290.05
	325		0.00		-0.01	0.310		-0.040				2242.76					294.04
209	326	0.28	0.00	0.06	-0.01	0.310	0.000	-0.040	-0.007	-1.71	-1.19	2246.01	293.70			-1.24	298.94
	327		0.00		-0.01	0.311						2250.17				-1.03	303.00
	328		0.00	0.07	-0.01	0.311		-0.052		-2.17		2253.37				-1.33	307.96
	329		0.00	0.01	0.02	0.118		-0.006				2257.65				-1.36	311.94
	330 331		0.00	0.01 -0.02	0.01	0.118 0.408	0.000	-0.007 0.088	-0.011	-2.17 -1.71		2260.71 2265.20				-1.72 -2.27	317.02 320.64
	332 333		0.00	0.02	0.01	0.119 0.119		-0.018 -0.018				2267.97 2272.00				-2.35 -2.51	326.15 330.33
	334		0.00	0.02	0.00	0.119		-0.031				2274.91				-2.97	335.61
	335		0.00	0.03	0.00	0.119		-0.031		-3.81		2278.80				-3.16	339.92
219	336	0.10	0.00	0.03	0.00	0.108	0.000	-0.032	-0.003	-4.30	-3.66	2281.59	338.83			-3.64	345.33
220	337	0.09	0.00	0.03	-0.01	0.097	0.000	-0.033	0.007	-4.68	-4.01	2285.51	342.99			-3.99	349.65
221	338	0.09	0.00	0.04	-0.01	0.097	0.000	-0.045	0.006	-5.48	-4.61	2288.27	348.30			-4.56	355.12
222	339	0.07	0.00	0.03	-0.01	0.075	0.000	-0.034	0.008	-5.54	-4.86	2291.93	352.71			-4.82	359.67
\boldsymbol{z}	= 118																
	281		0.00	0.01	0.00	0.043	0.000	-0.011	-0.000	-5.28	-4.74	1981.73	194.00			-4.75	198.47
	282		0.00	0.00	0.00	0.000	0.000	0.000	0.000			1991.49				-5.26	196.73
165	283	0.04	0.00	-0.01	0.00	0.043	0.000	0.013	0.001	-6.18	-5.53	1999.14	192.73			-5.53	197.10
166	284			-0.01	0.00	0.064	0.000	0.014	0.001			2008.27					195.98
167	285	0.07	0.00	-0.01	0.01	0.075	0.000	0.014	-0.009	-6.85	-6.12	2015.86	192.14			-6.12	196.41
	286			-0.01	0.01	0.075	0.000		-0.009	-6.98		2024.76				-6.25	195.55
	287		0.00	0.00	0.01	0.075	0.000		-0.010	-7.43		2032.12				-6.71	196.22
	288		0.00	0.01	0.01	0.086	0.000	-0.009		-7.54		2040.73				-6.79	195.65
	289 290		0.00	0.01 0.02	0.01	0.086	0.000	-0.009 -0.021		-7.99 -8.01		2047.84 2056.12				-7.22 -7.21	196.57 196.34
	291		0.00					-0.021		-8.44		2062.97					197.53
	291		0.00	0.02 0.03	0.00 -0.01	0.075 0.075		-0.022 -0.034	-0.002 0.008	-8.44 -8.57		2070.99				-7.60 -7.54	197.55
	293		0.00		-0.01	0.075		-0.046	0.007	-9.10		2077.52				-7.83	199.09
	294		0.00		-0.01	0.064		-0.034	0.008			2085.10					199.57
177	295	-0.08	0.00	0.01	-0.01	-0.084	0.000	-0.009	0.010	-8.66	-8.21	2091.77	196.96			-8.21	200.95
178	296	-0.06	0.00	0.00	-0.01	-0.063	0.000	0.002	0.010	-8.46	-7.93	2099.12	197.67			-7.93	201.66
179	297	-0.04	0.00	0.00	0.00	-0.042	0.000	0.001	0.000	-8.63	-8.01	2105.02	199.85			-8.02	203.83
		-0.03		0.01		-0.032	0.000	-0.011	0.000			2112.03					204.89
		-0.01		0.00		-0.011	0.000	0.000	0.000			2117.69					207.30
	300		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2124.43					208.63
	301		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2129.82					211.32
	302 303		0.00	0.00	0.00	0.000 0.000	0.000 -0.013	0.000	0.000 0.000	-7.29		2136.21 2140.55					213.01 216.76
	304		0.00	0.00	0.00	0.000	0.000	0.000	0.000	-5.61		2146.61					218.79
	305	-0.02			0.00		0.000	0.012	-0.000			2150.51					222.97
	306		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2156.36					225.22
		-0.39				-0.397	0.000	-0.006	0.024			2160.69					228.82
		-0.39				-0.397	0.000	0.004	0.020			2166.70					230.92
		-0.40				-0.407	0.000	0.007	0.020			2171.21					234.48
192	310	-0.40	0.00	0.05	-0.01	-0.407	0.000	0.007	0.020	-3.75	-1.66	2176.95	232.85			-1.83	236.88
		-0.40				-0.407	0.000	0.007	0.020			2181.32					240.60
		-0.41		0.05		-0.416	0.000	0.009	0.011			2186.89					243.13
		-0.41		0.05		-0.416	0.000	0.009	0.011			2191.09				-1.30	
	314	-0.41	0.00	0.04	0.00	-0.416 0.551	0.000 0.000	0.020 0.114				2196.56 2204.21					249.70 250.18
	316 317		0.00	0.01	0.01	0.552 0.552	0.000 0.000	0.102 0.102	0.009			2209.71 2213.85					252.81 256.77
	318		0.00	0.01	0.00	0.332	0.000					2215.85					262.34
				0.02	0.00	3.317	3.000	5.012	3.005	1.20	2					1.07	

N	A	$arepsilon_2$	ϵ_3	ϵ_4	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	$E_{ m mic}$	$E_{ m bind}$	$M_{ m th}$	$M_{\rm exp}$	$\sigma_{ m exp}$	$E_{ m mic}^{ m FL}$	$M_{ m th}^{ m FL}$
										(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
\boldsymbol{Z}	= 118																
	319		0.00	0.02	0.00	0.308	0.000					2220.53				-1.91	
	320 321		0.00	0.02 0.03	0.00	0.308 0.308	0.000 0.000		-0.003 -0.006	-1.63 -1.75		2225.80 2229.40				-1.88	269.39 273.93
	321		0.00	0.03	0.00	0.308	0.000		-0.006	-1.73 -1.39		2234.21				-1.92 -1.60	
	323			0.05	0.00		0.000	0.022	0.010			2236.22				-0.41	283.23
206	324	-0.46	0.00	0.05	0.00	-0.465	0.000	0.025	0.009	-2.19	0.04	2240.98	281.81			-0.21	286.63
207	325	-0.46	0.00	0.05	0.00	-0.465	0.000	0.025	0.009	-2.42		2244.42				-0.43	291.33
		-0.47		0.05		-0.474	0.000	0.030	0.017	-2.32		2248.99				-0.18	294.96
	327 328		0.00	0.06 0.01	-0.01 0.01	0.310 0.239	0.000 0.000	-0.040	-0.007 -0.011	-1.50 -0.93		2253.22 2257.52				-1.13 -0.81	299.10 302.97
	329			-0.03		0.239	0.000					2260.81					307.93
	330		0.00	-0.03	0.02 -0.01	0.172	-0.014	-0.049	-0.013 -0.013	-1.63 -2.22		2265.25				-1.10 -1.11	311.64
	331			-0.02	0.01	0.408	0.000	0.088	0.010			2269.42				-2.61	315.56
	332			-0.02	0.01	0.408	0.000	0.088	0.010			2273.62				-2.48	319.57
	333			-0.02	0.01	0.408	0.000	0.088	0.010	-1.96		2276.38				-2.65	324.97
	334			-0.02	0.01	0.408	0.000	0.088	0.010			2280.38				-2.49	329.18
	335 336		0.00	0.03	0.00	0.119 0.119	0.000	-0.031 -0.031	-0.004 -0.004	-3.14 -3.33		2282.93 2287.10				-2.52 -2.69	334.89 338.92
	337		0.00		-0.00	0.119		-0.031 -0.045	0.004	-3.33 -4.11		2290.01				-3.25	344.25
	338		0.00		-0.01	0.097		-0.045	0.006	-4.49	-3.66	2294.20	341.58			-3.61	348.26
221	339	0.09	0.00	0.04	-0.01	0.097	0.000	-0.045	0.006	-5.09	-4.24	2296.95	346.91			-4.18	353.72
\boldsymbol{z}	= 119	ı															
	284		0.00	-0.01	0.00	0.032	0.000	0.012	0.000	-6.11	-5.49	1997.16	201.99			-5.50	206.66
	285	0.06	0.00	0.00	0.00	0.064	0.000	0.002	0.000	-6.17	-5.56	2006.26	200.97			-5.57	205.58
	286		0.00	0.00	0.00	0.064	0.000	0.002	0.000			2014.18				-6.02	205.68
	287 288	-0.08	0.00	-0.01 0.00	0.00	-0.084 0.075	0.000 0.000		-0.001 -0.010	-6.82 -7.27		2023.36 2030.74				-6.43 -6.57	204.51 205.16
	289 290		0.00	0.01 0.02	0.01	0.086		-0.009 -0.021		-7.41 -7.96		2039.41 2046.90				-6.68 -7.17	204.53 205.07
	291		0.00	0.03	0.00	0.086		-0.033		-8.13		2055.22				-7.17	204.79
	292		0.00	0.03		0.086	0.000	-0.034	0.007			2062.45				-7.61	205.61
	293	0.07	0.00	0.04	-0.01	0.075		-0.046				2070.51				-7.57	
	294		0.00		-0.02	0.075						2077.41					206.75
	295 296		0.00		-0.02 -0.01	0.075 0.064		-0.046 -0.034	0.017			2084.98 2091.46					207.23 208.79
		-0.06				-0.063	0.000	-0.034 0.002	0.008			2091.40					208.79
		-0.03		0.00		-0.032	0.000	0.000	0.000			2105.32					211.05
180	299	-0.03	0.00	0.01	0.00	-0.032	0.000	-0.011	0.000	-8.17	-7.49	2112.41	207.82			-7.49	212.02
		-0.02	0.00	0.01	0.00	-0.021		-0.012	0.000			2118.38					214.11
	301		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2125.10					215.46
	302 303		0.00	0.00	0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000			2130.80 2137.20					217.84 219.51
	304		0.01	0.00	0.00	0.000		0.000	0.000			2141.85					222.94
	305		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2147.93					224.95
		-0.01				-0.010	0.000	0.012				2152.15					228.82
		-0.39				-0.397	0.000	0.004				2158.45					230.40
189	308	-0.40	0.00	0.06	-0.01	-0.407	0.000	-0.003	0.024	-5.59	-3.33	2163.51	229.35			-3.56	233.41
		-0.40				-0.407		-0.003				2169.55					235.49
		-0.40 -0.40				-0.407 -0.407	0.000 0.000	0.007 0.007	0.020			2174.38 2180.14					238.73 241.10
		-0.40 -0.40				-0.407 -0.406	0.000	0.007				2184.80					244.51
		-0.41		0.05		-0.416	0.000	0.009				2190.41				-2.11	247.01
195	314	-0.41	0.00	0.04	-0.01	-0.416	0.000	0.021	0.015	-3.77	-1.81	2194.91	246.38			-2.05	250.62
		-0.42		0.05		-0.426	0.000	0.012				2200.36				-1.65	253.29
		-0.42		0.05		-0.426	0.000	0.012				2204.66					257.08
		-0.42 -0.42		0.04		-0.426 -0.426	0.000 0.000	0.023 0.023				2210.01 2214.14					259.87 263.85
199	210	0.42	0.00	0.04	0.00	0.720	3.000	0.023	0.000	2.03	0.33	2217.17	200. 11			1.20	

N	A	$arepsilon_2$	ε_3	\mathcal{E}_4	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 119)															
200	319	-0.42	0.00	0.04	-0.01	-0.426	0.000	0.024	0.015	-2.57	-0.63	2219.32	262.33			-0.86	266.85
		-0.43				-0.435	0.000	0.027	0.014	-2.79		2223.59				-1.13	270.67
		-0.43				-0.435	0.000	0.027		-2.47		2228.64					273.78
		-0.43 -0.44				-0.435 -0.445	0.000 0.000	0.027 0.030	0.014	-2.62 -2.43		2232.61 2237.50				-0.97 -0.73	277.93 281.19
																	285.52
		-0.44 -0.45				-0.445 -0.455	0.000 0.000	0.030 0.033	0.014 0.013	-2.56 -2.45		2241.30 2246.07				-0.86 -0.65	285.52 288.91
		-0.45				-0.455	0.000	0.033	0.013	-2.65		2249.78				-0.86	293.33
		-0.45				-0.455	0.000	0.033	0.013	-2.39		2254.36				-0.62	296.93
209	328	-0.47	0.01	0.05	0.00	-0.474	-0.009	0.028	0.009	-2.61	-0.36	2257.73	296.57			-0.69	301.65
	329		0.00		-0.01	0.323	0.000	-0.049	-0.011	-1.44		2262.94				-0.98	304.90
	330		0.00		-0.01	0.311	0.000	-0.052	-0.010	-1.82		2266.39				-1.22	309.62
	331 332			-0.01 -0.02	0.00	0.409 0.408	0.000 0.000	0.074 0.088	0.015	-1.69 -2.09		2272.30 2275.56				-2.72 -2.94	311.82 316.73
	333			-0.02	0.00	0.409	0.000	0.033	0.010			2279.74				-2.94 -2.80	320.74
	334			-0.01	0.00	0.409	0.000	0.074	0.015	-2.01		2282.81				-3.00	325.82
	335			-0.01	0.00	0.409	0.000	0.074	0.015			2286.85				-2.87	329.99
217	336	0.37	0.00	-0.01	0.00	0.409	0.000	0.074	0.015	-2.10	-2.96	2289.78	329.09			-3.08	335.23
	337		0.00	0.00	0.00	0.421	0.000	0.065	0.011			2293.70					339.49
	338		0.00	0.04		0.097	0.000		0.006			2296.74				-3.29	344.81
220	339	0.09	0.00	0.04	-0.01	0.097	0.000	-0.045	0.006	-4.53	-3.69	2300.94	342.13			-3.65	348.81
\boldsymbol{Z}	= 120)															
167	287	-0.08	0.00	-0.01	0.00	-0.084	0.000	0.014	-0.001	-5.99	-5.61	2013.47	209.11			-5.63	213.97
						-0.104	0.000	0.016	0.008			2022.72					212.74
						-0.104	0.000	0.016	0.008			2030.42					213.06
	290		0.00	-0.01 0.03	-0.01 0.00	-0.125 0.086	0.000 0.000	0.018 -0.033	0.008 -0.003	-6.69 -7.34		2039.31 2046.55					212.19 212.99
	292		0.00		-0.00	0.086		-0.033	0.003	-7.42		2055.26					212.32
	293		0.00		-0.01	0.086		-0.034 -0.045	0.007	-7.42 -8.10		2062.49				-6.91	
	294		0.00		-0.02	0.086		-0.046	0.016	-8.22		2070.93					212.74
	295		0.00		-0.02	0.075		-0.046	0.017	-8.57		2077.82					213.90
176	296	0.07	0.00	0.04	-0.02	0.075	0.000	-0.046	0.017	-8.24	-6.92	2085.70	209.53			-6.91	214.06
	297		0.00		-0.02	0.064		-0.047	0.017			2092.17				-7.01	
		-0.06				-0.063 -0.032	0.000	0.002				2100.16					215.69
		-0.03 -0.03		0.00		-0.032 -0.032	0.000 0.000	0.000 -0.011	0.000 0.000			2106.33 2113.73					217.56 218.23
	301		0.00	0.00	0.00	0.000	0.000	0.000				2119.70					220.32
182	302	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000			2126.77				-6.29	221.30
	303		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2132.47					223.68
	304		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2139.18					225.04
	305		0.01	0.00	0.00	0.000	-0.013	0.000	0.000			2143.86					228.43
	306		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2150.24				-4.03	230.14
		-0.39				-0.397	0.000	0.004	0.020			2155.23					233.00
		-0.40 -0.40				-0.407 -0.407		-0.003 -0.003	0.024 0.024			2161.94 2167.05					234.40 237.36
		-0.40				-0.407		-0.003	0.024			2173.38					239.15
		-0.40				-0.407	0.000	0.007	0.020			2178.23					242.36
192	312	-0.41	0.00			-0.416	0.000	0.010	0.019			2184.29					244.41
		-0.41				-0.416	0.000	0.010	0.019			2189.01					247.78
		-0.42		0.05		-0.426	0.000	0.012	0.011			2194.91					249.96
		-0.42		0.05		-0.426	0.000	0.012				2199.46					253.51
		-0.42		0.05		-0.426	0.000	0.012				2205.26					255.85
		-0.42		0.04		-0.426	0.000	0.024				2209.56					259.65
		-0.43 -0.43		0.05		-0.436 -0.436	0.000 0.000	0.015 0.015				2215.20 2219.35				-1.44	262.13 266.07
		-0.43				-0.435	0.000	0.013				2224.85					268.74
		-0.43				-0.435	0.000	0.027				2229.07					272.63

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
7.	= 120)															
		-0.44	0.00	0.04	0.00	-0.445	0.000	0.029	0.006	-2.47	-0.75	2234.40	270.69			-1.00	275.43
203	323	-0.44	0.00	0.04	-0.01	-0.445	0.000	0.030	0.014	-2.58	-0.77	2238.30	274.86			-1.02	279.66
204	324	-0.44	0.00	0.04	-0.01	-0.445	0.000	0.030	0.014	-2.30	-0.38	2243.32	277.90			-0.60	282.79
		-0.45				-0.455	0.000					2247.29					286.92
206	326	-0.45	0.00	0.04	-0.01	-0.455	0.000	0.033	0.013	-2.32	-0.32	2252.23	285.14			-0.56	290.16
		-0.46		0.05		-0.465	0.000					2256.04				-0.88	294.45
		-0.46				-0.464	0.000			-2.41		2260.88				-0.60	297.80
		-0.46				-0.464	0.000					2264.46				-0.83	302.34
	331	-0.46		-0.04	-0.01 0.00	-0.464 0.409	0.000 0.000			-2.51		2269.30 2274.64				-0.72 -2.68	305.69 308.68
	332 333			-0.01 -0.01	0.00 0.00	0.409 0.409	0.000 0.000					2279.33 2282.60				-2.59 -2.83	312.18 317.05
	334			-0.01	0.00	0.409	0.000					2282.00					320.76
	335			-0.01	0.00	0.409	0.000					2290.17					325.84
	336			-0.01	0.00	0.409	0.000					2294.47				-2.76	329.73
	337	0.38	0.00	0.00	0.00	0.421	0.000					2297.43				-3.02	334.89
	338		0.00	0.00	0.00	0.421	0.000					2301.64					338.89
219	339		0.00	0.00	0.00	0.421	0.000					2304.46					344.24
7	= 121																
			0.00	0.01	0.01	-0.125	0.000	0.018	0.008	6.50	6.04	2028.31	217.71			-6.07	222.76
						-0.125 -0.125	0.000					2028.31				-6.07	222.76
						-0.125	0.000					2045.03				-6.53	222.08
						-0.124	0.000					2053.65				-6.48	221.49
	294		0.00		-0.01	0.075	0.000					2060.78				-6.47	
174	295	0.07	0.00	0.04	-0.02	0.075	0.000	-0.046	0.017	-7.77	-6.47	2069.22	217.15			-6.46	222.01
	296		0.00		-0.02	0.075		-0.046				2076.44				-6.78	222.83
176	297	0.07	0.00	0.04	-0.02	0.075	0.000	-0.046	0.017	-7.78	-6.47	2084.34	218.18			-6.46	222.98
177	298	0.06	0.00	0.03	-0.01	0.064	0.000	-0.034	0.008	-7.64	-6.63	2091.19	219.40			-6.64	224.16
178	299	-0.02	0.00	0.00	0.00	-0.021	0.000	0.000	0.000	-7.20	-6.57	2099.12	219.54			-6.58	224.27
179	300	-0.02	0.00	0.01	0.00	-0.021	0.000	-0.012	0.000	-7.48	-6.80	2105.81	220.92			-6.81	225.63
		-0.02		0.01		-0.021						2113.22					226.27
		-0.02		0.01		-0.021						2119.55					228.00
	303		0.00	0.00	0.00	0.000	0.000					2126.59					229.01
	304		0.00	0.00	0.00	0.000	0.000					2132.59					231.09
	305		0.00	0.00	0.00	0.000	0.000					2139.30					232.44
	306 307		0.01	0.00	0.00 0.00	0.000	-0.013 0.000					2144.32 2150.70				-4.48	235.49 237.19
		-0.40		0.00		-0.407						2156.41					237.19
		-0.40				-0.407						2163.16				-3.85	
		-0.40				-0.407						2168.57				-3.82	243.29
		-0.40				-0.407 -0.407						2174.93				-3.62 -3.41	245.05
		-0.41				-0.417						2180.08				-3.34	247.95
		-0.41		0.05	-0.01	-0.416	0.000					2186.20				-2.90	249.94
193	314	-0.41	0.00	0.05	-0.01	-0.416	0.000	0.010	0.019	-4.42	-2.60	2191.22	248.51			-2.87	253.00
194	315	-0.42	0.00	0.05	0.00	-0.426	0.000	0.012	0.011	-3.96	-2.20	2197.16	250.64			-2.47	255.15
195	316	-0.42	0.00	0.05	0.00	-0.426	0.000	0.012	0.011	-3.95	-2.17	2202.02	253.85			-2.47	258.37
		-0.43		0.05		-0.436	0.000					2207.85					260.66
		-0.43		0.05		-0.436	0.000					2212.48				-2.08	264.12
		-0.43		0.05		-0.436	0.000					2218.17				-1.76	266.57
		-0.43		0.04		-0.435	0.000					2222.62					270.20
		-0.43		0.04		-0.435	0.000					2228.15					272.84
		-0.44		0.05		-0.445	0.000					2232.46				-1.43	276.60
		-0.44 -0.45		0.04		-0.445 -0.455	0.000 0.000					2237.86 2242.02				-1.20 -1.23	279.35 283.28
		-0.45		0.05		-0.455	0.000					2247.31				-1.05	286.15
		-0.45 -0.46		0.04		-0.455 -0.465	0.000 0.000					2251.43 2256.56					290.16 293.16
200	J41	0.40	0.00	0.03	0.00	0.703	0.000	0.023	0.007	2.07	0.74	2230.30	200.07			1.05	2/3.10

N	A	ϵ_2	ϵ_3	$arepsilon_4$	ϵ_6	β_2	β_3	eta_4	eta_6	E_{s+p}	Emic	Ebind	$M_{ m th}$	Mexp	$\sigma_{\rm exp}$	$E_{ m mic}^{ m FL}$	M _{th} FL
										(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)	(MeV)
	= 121																
		-0.46				-0.464	0.000	0.036	0.013			2260.50					297.35
		-0.46 -0.47				-0.464 -0.474	0.000 0.000	0.036 0.030	0.013 0.017			2265.57 2269.42				-1.12 -1.33	300.46 304.73
	331	0.39		0.00	0.00		-0.013	0.030	0.017			2275.97					304.73
	332			-0.01	0.00		-0.013	0.078	0.016			2279.66				-2.93	311.01
212	333	0.37	0.01	-0.01	0.00	0.409	-0.013	0.074	0.015	-1.43	-2.73	2284.33	308.75			-2.82	314.52
	334			-0.01	0.00		-0.013	0.074	0.015	-1.66	-2.94	2287.89	313.27				319.11
	335		0.01	0.00	0.00		-0.013	0.065	0.011			2292.39					322.76
	336		0.01	0.00	0.00	0.421	-0.013	0.065	0.011			2295.75					327.55
	337		0.00	0.00	0.00	0.421	0.000	0.065	0.011			2300.10					331.39
	338 339		0.00	0.00	0.00	0.410 0.422	0.000 0.000	0.062 0.053	0.010 0.006			2303.30 2307.55				-3.23 -3.21	336.35 340.28
			0.00	0.01	0.00	0.422	0.000	0.055	0.000	-1.42	-3.00	2307.33	333.90			-3.21	340.26
	= 122																
						-0.124	0.000	0.029	0.007			2053.09					229.65
	295 296		0.00		-0.01 -0.01	-0.125 0.075	0.000 0.000	0.018 -0.046	0.008 0.007			2060.36 2068.61				-6.06 -5.53	230.40 230.20
	297		0.00		-0.01	0.075	0.000		0.007			2075.86					230.20
	298		0.00		-0.02	0.075	0.000		0.017			2084.07				-5.53	230.81
177	299	-0.08	0.00	0.00	-0.01	-0.084	0.000	0.003	0.010	-6.50	-6.25	2091.49	226.39			-6.26	231.42
178	300	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000			2099.28				-5.73	231.68
	301	-0.01		0.00	0.00		0.000	0.000	0.000			2106.00					233.00
	302		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2113.69				-5.57	
	303		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2120.06				-5.66	
	304 305		0.00	0.00	0.00 0.00	0.000 0.000	0.000	0.000 0.000	0.000 0.000			2127.44 2133.44				-5.17 -5.10	235.71 237.77
	306		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2140.46				-3.10 -4.46	
	307		0.01	0.00	0.00	0.000	-0.013	0.000	0.000			2145.50					241.83
186	308	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-3.36	-2.87	2152.19	238.33			-2.88	243.22
187	309	-0.40	0.00	0.06	-0.01	-0.407	0.000	-0.003	0.024	-5.18	-3.38	2158.36	240.23			-3.64	244.86
		-0.40				-0.407		-0.003	0.024			2165.42				-3.43	245.90
		-0.40 -0.40				-0.407 -0.407		-0.003 -0.003	0.024 0.024			2170.85 2177.50				-3.41 -2.99	248.53 249.99
		-0.40 -0.41				-0.407 -0.417		-0.003 -0.000	0.024			2182.67					252.87
		-0.41				-0.416	0.000	0.010				2189.10					254.54
		-0.42		0.06		-0.426	0.000	0.002	0.015			2194.10				-2.44	
		-0.42		0.05		-0.426	0.000	0.012	0.011	-3.36	-1.81	2200.40	254.69				259.40
		-0.43		0.05		-0.436	0.000	0.015	0.010			2205.26					262.60
196	318	-0.43	0.00	0.05	0.00	-0.436	0.000	0.015	0.010	-3.07	-1.48	2211.43	259.80			-1.75	264.56
		-0.43		0.05		-0.436	0.000	0.015	0.010			2216.09				-1.72	267.99
		-0.43 -0.44		0.04		-0.435 -0.445	0.000 0.000	0.025 0.018	0.006 0.010			2222.09 2226.60				-1.41	270.12 273.69
		-0.44		0.03		-0.445	0.000	0.018				2232.62					275.81
		-0.44		0.04		-0.445	0.000	0.029				2237.19					279.33
202	324	-0.44	0.00	0.04	0.00	-0.445	0.000	0.029	0.006	-2.43	-0.99	2242.81	276.85			-1.26	281.85
203	325	0.29	0.00	0.02	0.01	0.319	0.000	0.014	-0.013	-1.91	-2.47	2248.48	279.26			-2.55	284.51
		-0.46		0.05		-0.465	0.000	0.025	0.009			2252.57				-1.13	
		-0.46		0.05		-0.465	0.000	0.025	0.009	-2.52		2256.63					292.37
		-0.46		0.05		-0.465	0.000	0.025	0.009	-2.30		2261.86					295.30
		-0.47 -0.47		0.05		-0.474 -0.474	0.000 0.000	0.028 0.028	0.009			2266.02 2271.20				-1.21	299.24 302.23
	331		0.00	0.03	-0.00	-0.474 0.322	0.000	-0.028	-0.009			2275.52					306.29
	332		0.00	0.00	0.00	0.445	0.000	0.073	0.013			2281.94					307.98
	333	0.39	0.00	0.00	0.00	0.433	0.000	0.069	0.012			2285.58				-2.77	312.47
	334	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-0.70	-2.55	2290.53	309.84				315.70
	335		0.00		0.00	0.409	0.000	0.074	0.015			2294.10					320.30
	336		0.00	0.00	0.00	0.421	0.000	0.065	0.011			2298.89					323.66
215	337	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-1.05	-2.87	2302.29	322.30			-2.99	328.40

N	A	$arepsilon_2$	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 122																
	338	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-0.97	-2.80	2306.95	325.71			-2.90	331.94
217	339	0.37	0.00	0.00	0.00	0.410	0.000	0.062				2310.15				-3.08	336.89
7	= 123																
			0.00	-0.02	-0.01	-0.165	0.000	0.033	0.005	-6.16	-5.68	2066.79	234 16			-5.72	239.57
						-0.115	0.000	0.017	0.008			2074.19				-5.85	240.23
						-0.104	0.000	0.016	0.008	-5.82	-5.62	2082.53	234.56			-5.64	239.92
		-0.08				-0.084	0.000	0.003	0.010	-6.05		2089.76					240.73
		-0.01		0.00		-0.011	0.000	0.000	0.000			2097.64					240.90
		-0.01		0.00		-0.011	0.000	0.000	0.000	-6.18		2104.64				-5.58	241.94
	303 304	-0.02 0.00		0.01	0.00	-0.021 0.000	0.000 0.000	-0.012	0.000 0.000	-5.81 -5.86		2112.37					242.25 243.66
	305	0.00		0.00 0.00	0.00 0.00	0.000	0.000	0.000 0.000	0.000	-5.80 -5.33		2119.00 2126.39				-5.24 -4.74	244.32
	306	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-5.23		2132.69					246.08
184	307	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	-4.54	-4.00	2139.71	241.95			-4.01	247.11
185	308	0.00	0.01	0.00	0.00	0.000	-0.013	0.000	0.000	-3.70	-3.20	2145.08	244.65			-3.20	249.80
	309	0.00		0.00	0.00	0.000	0.000	0.000	0.000	-2.86		2151.78				-2.43	251.16
		-0.40				-0.407		-0.003	0.024	-4.88		2158.55					252.16
		-0.40				-0.407		-0.014	0.028	-4.92		2165.64				-3.32	253.18
		-0.40				-0.407		-0.003	0.024	-4.67		2171.37				-3.30	255.49
		-0.41 -0.41		0.06		-0.417 -0.417		-0.000 -0.001	0.024 0.015	-4.31 -4.11		2178.06 2183.55				-2.92 -2.87	256.89 259.44
		-0.41 -0.42		0.06		-0.417 -0.426	0.000	0.001	0.015	-3.70		2190.01				-2.67 -2.46	261.07
		-0.42		0.05		-0.426	0.000	0.012	0.011			2195.35				-2.43	263.79
194	317	-0.42	0.00	0.05	0.00	-0.426	0.000	0.012	0.011	-3.17	-1.77	2201.69	260.69			-2.08	265.57
		-0.43		0.05		-0.436	0.000	0.015	0.010	-3.26		2206.92				-2.14	268.40
		-0.43		0.05	0.00	-0.436	0.000	0.015	0.010	-2.92	-1.49	2213.08	265.44			-1.80	270.36
		-0.43		0.04		-0.435	0.000	0.025	0.006	-2.85		2218.05					273.46
		-0.44		0.05		-0.445	0.000	0.018	0.010	-2.68		2224.09					275.54
		-0.44		0.04		-0.445	0.000	0.029	0.006	-2.65		2228.92					278.80
		-0.44 -0.45		0.04 0.04		-0.445 -0.454	0.000	0.029 0.032	0.006 0.005	-2.49 -2.87		2235.00 2239.93				-1.49 -1.81	280.85 283.99
		-0.45		0.04		-0.454	0.000	0.032	0.005	-2.68		2245.70				-1.63	286.37
		-0.46		0.04		-0.464	0.000	0.035				2250.30				-1.80	
204	327	-0.46	0.00	0.04	0.00	-0.464	0.000	0.035	0.005	-2.60	-1.16	2255.78	287.32			-1.50	292.52
205	328	-0.46	0.00	0.04		-0.464	0.000	0.035				2260.06					296.33
		-0.47		0.05		-0.474	0.000	0.028				2265.48					299.05
		-0.47		0.05		-0.474	0.000	0.028		-2.88		2269.87					302.78
	331	0.30		0.05	0.00	0.333	0.000	-0.021	-0.014			2275.43					305.63
	332	0.29			-0.01 -0.01	0.322 -0.474	0.000 0.000					2279.49				-1.61	
	334	-0.47 0.40		0.04	-0.01	-0.474 0.445	0.000	0.040 0.060				2284.26 2289.88				-1.40 -3.07	312.84 315.51
	335	0.39			-0.01	0.434	0.000	0.055		-0.61		2294.87					318.73
213	336	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-0.99	-2.98	2298.68	317.06			-3.13	323.06
214	337	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-0.91	-2.93	2303.51	320.29			-3.05	326.40
215	338	0.38	0.00	0.00	0.00	0.421	0.000	0.065	0.011	-1.13	-3.12	2307.19	324.69			-3.27	330.86
216	339	0.38	0.00	0.01	0.00	0.422	0.000	0.053	0.006	-0.97	-3.05	2311.84	328.10			-3.20	334.37
\boldsymbol{z}	= 124																
			0.00	-0.02	-0.01	-0.226	0.000	0.042	0.003	-5.82	-5.07	2081.92	242.46			-5.15	248.07
						-0.225	0.000	0.054				2089.29					248.73
						-0.235	0.000	0.056				2097.90					248.16
						-0.255	0.000	0.048				2104.79					249.27
	304	0.00		0.00	0.00	0.000	0.000	0.000	0.000			2112.02					250.18
	305		0.00	0.00	0.00	0.000	0.000	0.000	0.000			2118.70					251.54
	306 307	0.00 0.00		0.00 0.00	0.00	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	-4.33 -4.22		2126.39 2132.69					251.90 253.64
	308	0.00		0.00	0.00	0.000	0.000	0.000				2140.02					254.35

N	A	$arepsilon_2$	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z	= 124																
185	309	-0.16	0.00	-0.02	-0.01	-0.165	0.000	0.033	0.005	-3.64	-3.35	2146.53	250.49			-3.39	255.87
		-0.39		0.08		-0.398						2153.61					256.62
		-0.40		0.08		-0.407				-4.61		2159.71				-3.07	258.54
	313	-0.40 0.39		0.07 0.07	0.00	-0.407 0.441						2167.11 2176.43				-2.87 -6.33	259.23 258.05
	314		0.00	0.07	0.02							2183.47				-5.97	259.11
	315	0.38		0.07	0.02		0.000		-0.032			2188.91				-5.85	261.71
192	316	-0.42	0.00	0.06	0.00	-0.426	0.000	0.002	0.015	-2.97	-1.68	2192.11	261.42			-1.97	266.51
		-0.42		0.06		-0.426		0.002				2197.46				-1.94	269.22
		-0.43		0.05		-0.436		0.015				2204.06				-1.57	270.70
		-0.43 -0.43		0.05		-0.436 -0.436		0.015 0.015				2209.30 2215.80				-1.61 -1.30	273.53 275.15
	321	0.48		0.00	0.00		0.000	0.013		-2.18 -2.08		2226.27				-6.70	273.13
		-0.44		0.04		-0.445		0.029				2227.33				-1.24	
199	323	-0.45	0.00	0.05	0.01	-0.455	0.000	0.020	0.002	-2.41	-1.26	2232.51	277.52			-1.60	282.69
		-0.45		0.04		-0.454		0.031				2238.84				-1.50	284.50
		-0.45		0.04		-0.454		0.032				2243.81				-1.84	287.60
	326	0.29		0.02	0.01		0.000					2251.42				-2.97	288.37
	327 328	0.29 0.29		0.02	0.01		0.000 0.000					2255.91 2261.55				-2.97 -2.57	291.98 294.47
	329	0.29		0.03	0.01		0.000					2265.73				-2.44	298.40
	330	0.29		0.03	0.00		0.000					2271.14				-2.44 -2.00	301.11
207			0.00	0.05	0.00							2275.20				-1.93	305.16
	332		0.00	0.05	0.00							2280.57				-1.61	307.94
209	333	0.30	0.00	0.06	0.00	0.334	0.000					2284.68				-1.74	311.96
	334		0.00	0.07			0.000					2289.94				-1.47	314.86
	335		0.00	0.00	0.00		0.000	0.073 0.060	0.013			2295.21				-2.99	317.66
	336 337		0.00	0.01	0.00 -0.01		0.000 0.000	-0.058	0.008 -0.015	0.01		2300.42 2302.69				-2.87 -1.40	320.59 326.55
	338		0.00	0.02	0.00		0.000	0.048	0.002			2309.32					327.96
215	339	0.39	0.00	0.02	-0.01	0.435	0.000	0.043	0.011	-0.50	-2.98	2313.00	326.17			-3.14	332.45
Z	= 125																
			0.00	-0.02	-0.02	-0.245	0.000	0.046	0.011	-6.40	-5.56	2096.09	251.72			-5.66	257.54
						-0.245		0.046				2103.29					258.36
180	305	-0.25	0.00	-0.02	-0.02	-0.255	0.000	0.048				2111.27					
						-0.266		0.039				2117.89					259.83
						-0.266		0.038				2125.55				-4.41	260.20
	308		0.00	0.00	0.00		0.000 0.000	0.000 0.000				2130.99				-3.03	262.92
	309 310		0.00	0.00	0.00		0.000					2138.34 2149.64				-2.37 -7.45	263.61 260.09
	311		0.00	0.06	0.02		0.000					2157.10				-7.09	260.70
187	312	0.39	0.00	0.06	0.02	0.440	0.000					2163.53				-7.23	262.32
188	313	0.39	0.00	0.07	0.02	0.441	0.000	-0.011	-0.041	-5.48	-6.69	2170.84	257.69			-6.92	263.10
	314	0.39		0.07	0.02							2177.05				-7.06	264.93
	315	0.39		0.07	0.02							2184.11					265.97
	316 317		0.00	0.07 0.07	0.02							2189.88 2196.55				-6.57 -6.07	268.27 269.66
																	272.31
	318 319	-0.43	0.00	0.07	0.01	-0.429 -0.436		-0.017 0.005				2201.97 2204.62					272.31
		-0.43		0.05		-0.436		0.015				2210.11				-1.56	
	321		0.00	-0.01	0.01		0.000	0.122				2222.54					276.00
197	322	0.48	0.00	0.00	0.01	0.539	0.000	0.109	0.014	-2.34	-7.03	2228.07	273.10			-7.33	278.49
		-0.45		0.05		-0.455		0.020				2228.71				-1.44	285.87
		-0.45		0.04		-0.454						2234.25				-1.87	288.40
		-0.45 -0.46		0.04 0.04		-0.454 -0.464						2240.66 2245.92				-1.83 -2.17	290.12 292.93
		-0.46		0.04		-0.464						2252.00					294.98
				5.01	5.01	27.01			2.000							/	

N	A	ϵ_2	ε_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
\boldsymbol{z}	= 125																
	328	0.29	0.00	0.02	0.01	0.319	0.000	0.014	-0.013	-2.41	-3.27	2258.43	291.17			-3.38	296.92
204	329	0.29	0.00	0.02	0.01	0.319	0.000	0.014	-0.013	-1.96	-2.85	2264.05	293.61			-2.95	299.42
	330	0.29		0.03	0.01		0.000					2268.52				-2.82	303.05
206			0.00	0.04	0.01		0.000					2273.90				-2.32	305.80
	332		0.00	0.05	0.00							2278.28				-2.29	309.52
	333	0.31		0.06	0.00							2283.67				-1.97	312.27
209	335		0.00	0.06	0.00			-0.033 -0.042	-0.017			2288.05 2293.35				-2.09 -1.85	316.01 318.87
	336		0.00		-0.00			-0.042				2297.57				-1.99	322.76
212	337	0.31			-0.01							2302.72				-1.76	325.78
213	338	0.40	0.00	0.02	-0.01	0.446	0.000	0.046	0.012	-0.28	-3.16	2308.14	322.18			-3.36	328.38
214	339	0.18	0.00	-0.03	0.02	0.193	0.000	0.052	-0.012	-1.22	-0.81	2310.97	327.42			-0.78	333.92
Z	= 126																
		-0.24	0.00	-0.02	-0.02	-0.245	0.000	0.046	0.011	-5.67	-4.88	2110.88	260.36			-4.98	266.43
						-0.266		0.039	0.022	-5.42		2117.56				-4.72	267.77
				-0.01	-0.03	-0.266	0.000	0.039	0.022	-4.86		2125.55				-4.17	267.82
		-0.26				-0.266		0.028	0.024			2131.94				-3.83	269.47
	310		0.00	0.05	0.02	0.426						2143.71				-7.42	265.60
185			0.00	0.06	0.02	0.440			-0.037			2150.31				-7.53	267.01
186 187			0.00	0.06	0.02	0.440	0.000		-0.037			2158.11 2164.58				-7.20 -7.38	267.29 268.85
	314		0.00	0.00	0.02		0.000					2172.23				-7.36 -7.10	269.29
	315		0.00	0.07	0.02							2178.47					271.09
190	316	0.39	0.00	0.07	0.02	0.441	0.000	-0.011	-0.041	-5.20	-6.66	2185.82	266.14			-6.87	271.83
191		0.38		0.07	0.02			-0.015		-5.36		2191.62				-6.76	274.09
192	318	0.38	0.00	0.07	0.01	0.429	0.000	-0.017	-0.032			2198.55				-6.21	275.23
193			0.00	0.07	0.01				-0.032			2204.01					277.82
	320		0.00	0.08	0.00				-0.027			2210.71				-5.37	279.20
195				-0.01	0.01		0.000	0.122	0.021			2218.39				-7.53	279.59
196 197			0.00	-0.01 0.00	0.02 0.01		0.000 0.000	0.124 0.109	0.011 0.014	-2.11 -2.30		2225.35 2230.94				-7.37 -7.68	280.74 283.17
198			0.00	0.00	0.01		0.000	0.109	0.014			2237.76				-7.56	284.48
199			0.00	0.01	0.01		0.000	0.102				2243.10				-7.84	
200	326	-0.46	0.00	0.04	0.01	-0.464	0.000	0.034	-0.003	-2.38	-1.56	2243.84	288.84			-1.91	294.45
201	327	-0.46	0.00	0.04	0.01	-0.464	0.000	0.034	-0.003	-2.75	-1.87	2249.13	291.62			-2.25	297.24
	328		0.00	0.02	0.01	0.319						2257.13					297.63
	329		0.00	0.02	0.01		0.000					2261.95					300.90
	330		0.00	0.03	0.01	0.320						2267.85				-3.03	303.11
205		0.29	0.00	0.03	0.01		0.000					2272.28 2278.03					306.78
	332 333		0.00	0.04	0.01							2282.43				-2.42 -2.40	309.16 312.85
	334		0.00	0.05	0.00							2288.10					315.32
209	335	0.30	0.00	0.06	0.00	0.334	0.000	-0.033	-0.017	-1.68	-2.12	2292.52	312.80			-2.22	319.02
210	336	0.31	0.00	0.07	0.00	0.347	0.000	-0.042	-0.021	-1.60	-1.90	2298.10	315.28			-1.98	321.58
211	337	0.30	0.00	0.07	0.00	0.335	0.000	-0.045	-0.021	-1.93	-2.05	2302.36	319.10			-2.13	325.45
212			0.00		-0.01							2307.76					328.19
213	339	0.30	0.00	0.08	-0.01	0.336	0.000	-0.058	-0.015	-1.92	-1.77	2311.66	325.94			-1.84	332.43
\boldsymbol{Z}	= 127																
		-0.26		0.00		-0.266		0.028				2130.37					278.62
184			0.00	0.06	0.02		0.000					2142.42					274.42
	312		0.00	0.06	0.02		0.000					2149.39					275.48
	313 314		0.00	0.06	0.02		0.000					2157.26 2164.03					275.68 276.94
	315 316		0.00	0.07 0.07	0.02							2171.73 2178.25					277.32 278.83
190			0.00	0.07	0.02							2185.64					279.55
						-							-			-	

N	A	$arepsilon_2$	ε_3	ε_4	ε_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
	= 127																
	318	0.38	0.00	0.07	0.02	0.429	0.000	-0.015	-0.041	-5.77	-7.09	2191.72	275.60			-7.35	281.51
192			0.00		0.01	0.429	0.000	-0.017	-0.032	-4.93	-6.57	2198.70	276.69			-6.83	282.60
	320		0.00		0.01			-0.029				2204.45				-6.58	284.89
194 195	321		0.00		0.00			-0.031 -0.031	-0.027 -0.027	-4.29 -4.03		2211.19 2216.76				-6.01 -5.77	286.23 288.71
	323		0.00		0.00			-0.031	-0.027	-3.48		2223.36				-5.24	290.22
197			0.00		0.00		0.000	0.109	-0.027	-2.51		2231.98				-8.29	289.61
198	325	0.49	0.00	0.01	0.01	0.552	0.000	0.102	0.009	-1.87	-7.80	2238.74	285.08			-8.14	290.92
199			0.00		0.01		0.000	0.102	0.009	-2.16		2244.48				-8.47	293.23
	327	-0.46				-0.464		0.034	-0.003			2244.99				-2.28	300.78
201 202	328	-0.47	0.00		0.01		0.000 0.000		-0.004 -0.013	-2.94 -2.60		2250.54 2258.65				-2.62 -3.85	303.27 303.60
202			0.00		0.01		0.000		-0.013 -0.022	-2.84		2263.77				-3.88	306.58
204	331	0.29	0.00	0.03	0.01		0.000	0.002	-0.016			2269.58				-3.34	308.86
205	332	0.29	0.00	0.03	0.01	0.320	0.000	0.002	-0.016	-2.24	-3.14	2274.40	305.92			-3.26	312.15
206			0.00		0.01				-0.020			2280.15				-2.84	314.50
207 208			0.00		0.01			-0.020 -0.030		-2.03 -1.64		2284.86 2290.53				-2.82 -2.50	317.90 320.34
208			0.00		0.00			-0.030 -0.033				2290.33					323.77
210			0.00		0.00			-0.042				2300.84				-2.42	326.28
211	338	0.30	0.00	0.07	0.00	0.335	0.000	-0.045	-0.021	-2.24	-2.43	2305.36	323.39			-2.54	329.89
212	339	0.31	0.00	0.08	-0.01	0.347	0.000	-0.056	-0.015	-2.15	-2.21	2310.79	326.03			-2.32	332.59
Z :	= 128																
185			0.00	0.06	0.02	0.440	0.000	0.000	-0.037	-5.52	-7.80	2149.28	276.90			-8.11	283.20
	314	0.39	0.00	0.07	0.02			-0.011	-0.041	-5.59	-7.52	2157.44	276.82			-7.81	283.12
187			0.00		0.02			-0.011		-5.84		2164.28				-8.02	284.30
188 189			0.00		0.02	0.441		-0.011 -0.011		-5.61 -5.75		2172.28 2178.83				-7.78 -7.91	284.37 285.86
190			0.00		0.02				-0.041 -0.037	-5.73		2176.65				-7.51	286.24
190			0.00		0.01			-0.025		-5.43		2192.60				-7.37 -7.45	288.17
192		0.38	0.00	0.08	0.01				-0.037	-5.19		2199.92				-6.91	288.96
193			0.00		0.01			-0.029		-4.97		2205.71				-6.69	291.21
194			0.00		0.01							2212.74				-6.09	292.28
195			0.00		0.00							2218.32					294.72
196 197	324		0.00		0.00							2225.23 2230.52				-5.34 -5.00	295.92 298.67
198			0.00		0.00		0.000	0.102				2241.32				-8.63	
199			0.00		0.01		0.000	0.102				2247.00				-8.88	298.28
200	328	0.49	0.00	0.02	0.00	0.553	0.000	0.087	0.012	-1.90	-8.31	2253.79	293.46			-8.64	299.59
	329	-0.47			0.01							2253.04				-2.71	308.32
202			0.00		0.02		0.000					2261.38				-3.87	308.42
203204			0.00		0.02		0.000 0.000					2266.50 2272.69					311.38 313.28
205			0.00		0.01		0.000					2277.52					316.54
206			0.00		0.01							2283.55					318.62
207			0.00		0.01							2288.31					321.96
	336		0.00		0.00							2294.25					324.14
209			0.00		0.00							2299.00					327.49
210211			0.00		0.00 0.00							2304.89 2309.45					329.72 333.28
			0.00	0.07	0.00	0.333	0.000	-0.0 4 3	-0.021	-2.31	-2.03	2307.43	520.50			-2.13	JJJ.20
	= 129		0.00	0.07	0.00	0.441	0.000	0.011	0.041	£ 00	7.00	01/0.75	207.07			0.24	202.20
187 188	316		0.00		0.02							2162.75 2170.77				-8.34 -8.09	293.39 293.45
189			0.00		0.02							2170.77				-8.09 -8.29	293.43
190			0.00		0.02							2185.43					294.89
191	320	0.38	0.00	0.08	0.01	0.430	0.000	-0.029	-0.037	-5.91	-7.53	2191.82	290.08			-7.85	296.52

N	A	ε_2	ϵ_3	$arepsilon_4$	ϵ_6	eta_2	β_3	eta_4	eta_6	E _{s+p} (MeV)	E _{mic} (MeV)	E _{bind} (MeV)	M _{th} (MeV)	M _{exp} (MeV)	σ _{exp} (MeV)	E _{mic} (MeV)	M _{th} FL (MeV)
Z:	= 129																
192		0.38	0.00	0.08	0.01	0.430	0.000	-0.029	-0.037	-5.39	-7.03	2199.15	290.82			-7.33	297.27
193	322	0.38	0.00	0.08	0.01	0.430	0.000	-0.029	-0.037	-5.20	-6.83	2205.28	292.76			-7.14	299.18
194			0.00		0.00				-0.032			2212.41				-6.64	
	324		0.00		0.00							2218.24					302.34
	325		0.00		0.00				-0.032			2225.21				-5.87	303.46
	326		0.00		-0.01			-0.057 -0.057				2230.75				-5.50	305.95
198	328		0.00		-0.01 0.01		0.000	-0.057 0.102		-3.59 -2.44		2237.52 2247.73				-5.01 -9.57	307.28 305.04
200			0.00		0.00	0.553		0.087	0.012			2254.56				-9.35	306.31
201	330	-0.48	0.00	0.04	0.02	-0.483	0.000	0.039	-0.012			2253.80				-3.11	315.05
202	331	0.29	0.00	0.02	0.02	0.319	0.000	0.015	-0.022	-3.02	-4.15	2262.16	308.52			-4.25	315.16
203	332	0.29	0.00	0.03	0.01	0.320	0.000	0.002	-0.016	-3.04	-4.14	2267.55	311.21			-4.28	317.83
204			0.00		0.01	0.320			-0.016			2273.82					319.65
	334 335		0.00		0.01	0.320						2278.94					322.63
					0.01							2285.01 2290.05				-3.38	324.67
207	336 337		0.00		0.01			-0.010		-2.30		2290.03				-3.39	327.72 329.88
	338		0.00		0.00							2301.01					332.95
210	339	0.30	0.00	0.07	0.00							2306.92					335.18
Z :	= 130																
	319	0.39	0.00	0.08	0.02	0.443	0.000	-0.023	-0.046	-5.96	-7.89	2177.42	295.62			-8.22	302.44
	320		0.00		0.01							2185.45				-7.91	
191	321	0.38	0.00	0.08	0.01	0.430	0.000	-0.029	-0.037	-5.61	-7.53	2191.94	297.25			-7.85	304.02
192			0.00		0.01				-0.037			2199.52				-7.28	304.52
193			0.00		0.00				-0.032			2205.64				-7.08	306.41
194			0.00		0.00				-0.032			2213.09				-6.58	307.05
195 196	325		0.00	0.09	0.00 -0.01			-0.043 -0.057		-4.28		2218.93				-6.29	309.24
190					-0.01			-0.057 -0.057		-4.11 -3.93		2226.12 2231.89				-5.75 -5.56	310.12 312.40
198					-0.01				-0.027			2238.94				-5.07	313.45
199	329	0.38	0.00	0.11	-0.02	0.433	0.000	-0.071	-0.023	-3.71	-4.60	2244.53	309.23			-4.91	315.90
	330				-0.02			-0.071		-3.29	-4.22	2251.48	310.35			-4.49	317.06
201			0.00		0.02		0.000					2257.26					319.52
	332		0.00		0.02	0.319						2264.24					320.64
203			0.00		0.02	0.320						2269.67					323.28
204			0.00		0.02		0.000					2276.24					324.82
205	336		0.00		0.01 0.01							2281.33 2287.74					327.77 329.48
207			0.00		0.01							2292.78					332.52
208			0.00		0.01							2299.06					334.36
209	339	0.29	0.00	0.06	0.00	0.322	0.000	-0.036	-0.017	-2.60	-3.26	2304.07	330.40			-3.38	337.43
7	= 131																
2 : 192		0.38	0.00	0 00	0.00	0.431	0 000	_0.043	_0.032	_5.46	_7 3/1	2198.04	306 51			_7 70	313.55
193			0.00		0.00							2204.50					315.11
	325		0.00		0.00							2211.91					315.78
195					-0.01							2218.04					317.67
196	327	0.38	0.00	0.10	-0.01	0.432	0.000	-0.057	-0.027	-4.39	-5.91	2225.38	311.45			-6.25	318.42
	328				-0.01							2231.44					320.40
198					-0.02							2238.49					321.43
200	330 331				-0.02 -0.02							2244.45 2251.33					323.51 324.73
201					-0.02 -0.02							2257.08					327.04
202			0.00		0.02	0.308						2264.28					328.16
203			0.00		0.02	0.320						2270.09					330.40
204			0.00		0.02		0.000					2276.67					331.92
205	336	0.29	0.00	0.04	0.01	0.321	0.000	-0.010	-0.020	-3.06	-4.21	2282.08	327.39			-4.35	334.56

N	A	ε_2	ε_3	ε_4	ε_6	eta_2	β_3	eta_4	eta_6	E_{s+p} (MeV)	E _{mic} (MeV)	$E_{\rm bind}$ (MeV)	$M_{\rm th}$ (MeV)	M _{exp} (MeV)	$\sigma_{\rm exp}$ (MeV)	$E_{ m mic}^{ m FL}$ (MeV)	$M_{ m th}^{ m FL}$ (MeV)
Z:	= 131																
206	337	0.29	0.00	0.04	0.01	0.321	0.000	-0.010	-0.020	-2.66	-3.85	2288.50	329.05			-3.98	336.25
207	338	0.29	0.00	0.05	0.01	0.322	0.000	-0.022	-0.023	-2.96	-3.87	2293.84	331.77			-4.00	338.98
208	339	0.29	0.00	0.05	0.01	0.322	0.000	-0.022	-0.023	-2.61	-3.56	2300.14	333.55			-3.68	340.80
$oldsymbol{Z}$:	= 132																
												2211.86					323.44
												2218.13				-6.72	325.20
								-0.057				2225.73				-6.25	325.69
								-0.071 -0.071				2231.80 2239.24					327.64 328.29
								-0.071				2245.14				-5.49	330.44
								-0.083				2252.35				-5.04	331.32
								-0.085				2258.21					333.50
			0.00			0.308			-0.023 -0.023			2265.70 2271.50				-4.84	334.32
			0.00			0.308										-4.93	336.59
			0.00									2278.31					337.85
			0.00					-0.010				2283.81				-4.50	340.40
			0.00									2290.51				-4.12	341.80
207	339	0.29	0.00	0.05	0.01	0.322	0.000	-0.022	-0.023	-3.02	-4.05	2295.92	336.99			-4.18	344.47
$oldsymbol{Z}$:	= 133																
196	329	0.38	0.00	0.11	-0.02	0.433	0.000	-0.071	-0.023	-4.86	-6.34	2224.26	327.15			-6.74	334.72
197	330	0.38	0.00	0.11	-0.02	0.433	0.000	-0.071	-0.023	-4.77	-6.22	2230.71	328.77			-6.64	336.30
198	331	0.38	0.00	0.11	-0.02	0.433	0.000	-0.071	-0.023	-4.33	-5.74	2238.07	329.48			-6.13	337.02
								-0.083				2244.32				-6.01	338.81
200	333	0.38	0.00	0.12	-0.02	0.435	0.000	-0.083	-0.027	-4.47	-5.28	2251.63	332.06			-5.64	339.59
201	334	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.47	-5.24	2257.77	333.99			-5.62	341.49
202	335	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.14	-4.94	2264.94	334.90			-5.30	342.43
203	336	0.28	0.00	0.02	0.02	0.308	0.000	0.013	-0.023	-3.92	-5.27	2271.26	336.65			-5.40	344.39
			0.00									2278.09				-4.97	345.63
205	338	0.37	0.00	0.12	-0.03	0.422	0.000	-0.089	-0.017	-4.20	-4.61	2283.68	340.38			-4.94	347.92
206	339	0.37	0.00	0.12	-0.03	0.422	0.000	-0.089	-0.017	-3.85	-4.30	2290.45	341.68			-4.60	349.26
$oldsymbol{Z}$:	= 134																
198	332	0.38	0.00	0.12	-0.02	0.435	0.000	-0.083	-0.027	-4.72	-5.77	2238.06	336.78			-6.15	344.67
199	333	0.38	0.00	0.12	-0.02	0.435	0.000	-0.083	-0.027	-4.71	-5.73	2244.41	338.50			-6.13	346.35
200	334	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.36	-5.40	2252.01	338.97			-5.76	346.83
201	335	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.36	-5.37	2258.18	340.87			-5.75	348.70
202	336	0.38	0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.03	-5.07	2265.63	341.50			-5.41	349.35
203	337	0.27	0.00	0.02	0.02	0.296	0.000	0.010	-0.023	-4.16	-5.37	2271.94	343.26			-5.48	351.33
204	338	0.28	0.00	0.03								2279.14				-5.12	
205	339	0.28	0.00	0.04								2284.88				-5.06	354.51
Z :	= 135																
			0.00	0.12	-0.03	0.434	0.000	-0.085	-0.018	-4.73	-5.90	2257.05	349.30			-6.34	357.41
												2264.51					358.04
			0.00									2271.10					359.77
												2278.08					360.63
$oldsymbol{Z}$:	= 136																
			0.00	0.02	0.02	0.296	0.000	0.010	-0.023	-4.68	-6.09	2271.20	358.58			-6.22	367 32