```
(*Nuclear Species Experimental Data*)
isotopeName = "Np-237";
databaseName = "JENDL-5";

atomicNumber = 93;(*Atomic number*)
neutronNumber = 238 - atomicNumber;
(*Compound nucleus neutron number*)(*Calculation Data Range*)

energyPattern = 3;(*Input required*)(*energyPattern=1;
Data at 0.0253eV*)(*energyPattern=2;
Data at 0.0253eV,500keV*)(*energyPattern=3;
Data at 0.0253eV,500keV,14MeV*)(*energyPattern=4;
Data at 500keV*)(*Incident Neutron Kinetic Energy*)



promptNeutrons1 = 2.683;(*0.0253 eV*)
promptNeutrons2 = 2.788;(*500 keV*)
promptNeutrons3 = 4.401;(*14 MeV*)

(*Neutron Separation Energy*)
neutronSeparationEnergy = 5488.3 / 1000;

(*Charge Distribution Experimental Data JENDL-5*)
yieldData0253eV = {{23, 0}, {24, 1.2366184 * 10^(-14)},
   {25, 7.5660990 * 10^(-12)}, {26, 7.1694639 * 10^(-10)},
   {27, 1.4679867 * 10^(-08)}, {28, 2.2108561 * 10^(-07)}, {29, 2.6201195 * 10^(-06)},
   {30, 3.4157452 * 10^(-05)}, {31, 2.8787503 * 10^(-04)}, {32, 1.6328759 * 10^(-03)},
   {33, 7.0670885 * 10^(-03)}, {34, 2.2541543 * 10^(-02)}, {35, 5.1407049 * 10^(-02)},
   {36, 7.9801254 * 10^(-02)}, {37, 1.1107101 * 10^(-01)}, {38, 1.3054844 * 10^(-01)},
   {39, 1.5082325 * 10^(-01)}, {40, 1.5094233 * 10^(-01)}, {41, 1.3387947 * 10^(-01)},
   {42, 8.7778448 * 10^(-02)}, {43, 6.5416018 * 10^(-02)}, {44, 5.4426687 * 10^(-03)},
   {45, 6.8314520 * 10^(-04)}, {46, 4.3927045 * 10^(-04)}, {47, 3.8074265 * 10^(-04)},
   {48, 3.6359696 * 10^(-04)}, {49, 3.3380037 * 10^(-03)}, {50, 3.5669718 * 10^(-02)},
   {51, 8.8553397 * 10^(-02)}, {52, 1.5352430 * 10^(-01)}, {53, 1.7325087 * 10^(-01)},
   {54, 1.5198723 * 10^(-01)}, {55, 1.4274942 * 10^(-01)}, {56, 1.1177843 * 10^(-01)},
   {57, 7.4127172 * 10^(-02)}, {58, 3.9671476 * 10^(-02)}, {59, 1.7617974 * 10^(-02)},
   {60, 5.4008932 * 10^(-03)}, {61, 1.4852543 * 10^(-03)}, {62, 2.8361638 * 10^(-04)},
   {63, 1.7705378 * 10^(-05)}, {64, 1.3369675 * 10^(-06)}, {65, 1.2400244 * 10^(-07)},
   {66, 8.0917851 * 10^(-09)}, {67, 2.2833522 * 10^(-10)}, {68, 6.3775592 * 10^(-12)},
   {69, 4.0918974 * 10^(-14)}, {70, 2.5176784 * 10^(-17)}, {71, 0}};

yieldData500keV = {{23, 2.4216600 * 10^(-18)}, {24, 4.6329620 * 10^(-14)},
   {25, 2.6124906 * 10^(-11)}, {26, 1.9091364 * 10^(-09)},
   {27, 3.5241915 * 10^(-08)}, {28, 9.6124824 * 10^(-07)}, {29, 8.1157375 * 10^(-06)},
   {30, 9.6312456 * 10^(-05)}, {31, 6.0775399 * 10^(-04)}, {32, 3.4875973 * 10^(-03)},
   {33, 1.0151961 * 10^(-02)}, {34, 2.3955642 * 10^(-02)}, {35, 4.2796761 * 10^(-02)},
   {36, 7.7991022 * 10^(-02)}, {37, 1.0835120 * 10^(-01)}, {38, 1.3270346 * 10^(-01)},
   {39, 1.4581256 * 10^(-01)}, {40, 1.6011641 * 10^(-01)}, {41, 1.3720023 * 10^(-01)},
   {42, 9.2656413 * 10^(-02)}, {43, 5.4987197 * 10^(-02)}, {44, 6.4181814 * 10^(-03)},
   {45, 1.2103986 * 10^(-03)}, {46, 1.1906223 * 10^(-03)}, {47, 1.1417268 * 10^(-03)},
```

```
    {48, 1.2791297 * 10^(-03)}, {49, 6.0166673 * 10^(-03)}, {50, 5.7793492 * 10^(-02)},
    {51, 8.8591080 * 10^(-02)}, {52, 1.4012149 * 10^(-01)}, {53, 1.5511815 * 10^(-01)},
    {54, 1.5456763 * 10^(-01)}, {55, 1.2864242 * 10^(-01)}, {56, 1.1126612 * 10^(-01)},
    {57, 7.4779630 * 10^(-02)}, {58, 4.5392842 * 10^(-02)}, {59, 2.1804352 * 10^(-02)},
    {60, 9.6560090 * 10^(-03)}, {61, 3.2606576 * 10^(-03)}, {62, 7.3855271 * 10^(-04)},
    {63, 7.9090950 * 10^(-05)}, {64, 7.4685491 * 10^(-06)}, {65, 5.8955781 * 10^(-07)},
    {66, 5.2074012 * 10^(-08)}, {67, 6.3277668 * 10^(-09)}, {68, 1.7727420 * 10^(-09)},
    {69, 4.3389506 * 10^(-11)}, {70, 1.0278290 * 10^(-13)}, {71, 0}};

yieldData14MeV = {{23, 3.4439500 * 10^(-13)}, {24, 2.8185591 * 10^(-09)},
    {25, 8.5896215 * 10^(-07)}, {26, 2.6706401 * 10^(-05)}, {27, 1.3936495 * 10^(-04)},
    {28, 3.4544426 * 10^(-04)}, {29, 6.9151628 * 10^(-04)}, {30, 1.3246810 * 10^(-03)},
    {31, 2.6355114 * 10^(-03)}, {32, 4.9146896 * 10^(-03)}, {33, 9.4861986 * 10^(-03)},
    {34, 1.7787808 * 10^(-02)}, {35, 3.3635573 * 10^(-02)}, {36, 5.9417085 * 10^(-02)},
    {37, 9.6133546 * 10^(-02)}, {38, 1.2474173 * 10^(-01)}, {39, 1.3039585 * 10^(-01)},
    {40, 1.2432657 * 10^(-01)}, {41, 1.1158834 * 10^(-01)}, {42, 9.7661579 * 10^(-02)},
    {43, 7.3862400 * 10^(-02)}, {44, 4.1655867 * 10^(-02)}, {45, 3.2902950 * 10^(-02)},
    {46, 3.1985275 * 10^(-02)}, {47, 3.3950757 * 10^(-02)}, {48, 3.4272983 * 10^(-02)},
    {49, 4.4601947 * 10^(-02)}, {50, 7.7843310 * 10^(-02)}, {51, 9.5904561 * 10^(-02)},
    {52, 1.1725384 * 10^(-01)}, {53, 1.2834671 * 10^(-01)}, {54, 1.2879193 * 10^(-01)},
    {55, 1.2060814 * 10^(-01)}, {56, 9.4562884 * 10^(-02)}, {57, 5.9262049 * 10^(-02)},
    {58, 3.2871304 * 10^(-02)}, {59, 1.7248926 * 10^(-02)}, {60, 9.1856534 * 10^(-03)},
    {61, 4.7748754 * 10^(-03)}, {62, 2.4037663 * 10^(-03)}, {63, 1.2742244 * 10^(-03)},
    {64, 6.2781998 * 10^(-04)}, {65, 3.1117443 * 10^(-04)}, {66, 1.5479592 * 10^(-04)},
    {67, 6.9450098 * 10^(-05)}, {68, 1.8235334 * 10^(-05)}, {69, 1.0538466 * 10^(-06)},
    {70, 6.9283391 * 10^(-09)}, {71, 3.5603000 * 10^(-12)}};

optResult0253eVRe1 =
  {1.8208832756065153`*^-14, {effectiveDistance0253eV[23, 70] -> 0.1883588976691272,
    effectiveDistance0253eV[24, 69] -> 0.5606582000790034,
    effectiveDistance0253eV[25, 68] -> 0.7616497515745668,
    effectiveDistance0253eV[26, 67] -> 0.8259690446725174,
    effectiveDistance0253eV[27, 66] -> 0.8862403910795995,
    effectiveDistance0253eV[28, 65] -> 0.9610880458995174,
    effectiveDistance0253eV[29, 64] -> 0.9877658311992737,
    effectiveDistance0253eV[30, 63] -> 1.0125900928393352`,
    effectiveDistance0253eV[31, 62] -> 1.0362668104066322`,
    effectiveDistance0253eV[32, 61] -> 1.0580089988783898`,
    effectiveDistance0253eV[33, 60] -> 1.078809510747324,
    effectiveDistance0253eV[34, 59] -> 1.0981391099683038`,
    effectiveDistance0253eV[35, 58] -> 1.1161452231547935`,
    effectiveDistance0253eV[36, 57] -> 1.1319863112400286`,
    effectiveDistance0253eV[37, 56] -> 1.1465990721632584`,
    effectiveDistance0253eV[38, 55] -> 1.1591538896369413`,
    effectiveDistance0253eV[39, 54] -> 1.1704772286150444`,
    effectiveDistance0253eV[40, 53] -> 1.1799585795796363`,
    effectiveDistance0253eV[41, 52] -> 1.1887186304565396`,
    effectiveDistance0253eV[42, 51] -> 1.195778234075976,
    effectiveDistance0253eV[43, 50] -> 1.2019032405175456`,
    effectiveDistance0253eV[44, 49] -> 1.2064637614566038`,
    effectiveDistance0253eV[45, 48] -> 1.2093794671078124`,
    effectiveDistance0253eV[46, 47] -> 1.2111675683911762`,
    effectiveDistance0253eV[47, 46] -> 1.211108716181667,
```

```
    effectiveDistance0253eV[48, 45] -> 1.2091203499342513`,
    effectiveDistance0253eV[49, 44] -> 1.206263291781404,
    effectiveDistance0253eV[50, 43] -> 1.2016554150256673`,
    effectiveDistance0253eV[51, 42] -> 1.1957818100718058`,
    effectiveDistance0253eV[52, 41] -> 1.1887740687177712`,
    effectiveDistance0253eV[53, 40] -> 1.1800140399475039`,
    effectiveDistance0253eV[54, 39] -> 1.1704803025504298`,
    effectiveDistance0253eV[55, 38] -> 1.1591893302921321`,
    effectiveDistance0253eV[56, 37] -> 1.1466015683965693`,
    effectiveDistance0253eV[57, 36] -> 1.1319576326795695`,
    effectiveDistance0253eV[58, 35] -> 1.1160456719994765`,
    effectiveDistance0253eV[59, 34] -> 1.0980458185593824`,
    effectiveDistance0253eV[60, 33] -> 1.0787093343974536`,
    effectiveDistance0253eV[61, 32] -> 1.057974308930423,
    effectiveDistance0253eV[62, 31] -> 1.0362614529388017`,
    effectiveDistance0253eV[63, 30] -> 1.0123588525459937`,
    effectiveDistance0253eV[64, 29] -> 0.9875343136366327,
    effectiveDistance0253eV[65, 28] -> 0.9608940490210044,
    effectiveDistance0253eV[66, 27] -> 0.8862403910799053,
    effectiveDistance0253eV[67, 26] -> 0.8259690446714483,
    effectiveDistance0253eV[68, 25] -> 0.7616497515746768,
    effectiveDistance0253eV[69, 24] -> 0.5606582000834542,
    effectiveDistance0253eV[70, 23] -> 0.18835889768059288`}};

optResult500keVRe1 =
  {3.1780148994481345`*^-13, {effectiveDistance500keV[23, 70] -> 0.2110742706953638,
    effectiveDistance500keV[24, 69] -> 0.572470641404365,
    effectiveDistance500keV[25, 68] -> 0.765859693420009,
    effectiveDistance500keV[26, 67] -> 0.8268885497363496,
    effectiveDistance500keV[27, 66] -> 0.8844821467976479,
    effectiveDistance500keV[28, 65] -> 0.9567871966357208,
    effectiveDistance500keV[29, 64] -> 0.9836499843896428,
    effectiveDistance500keV[30, 63] -> 1.00876478127544,
    effectiveDistance500keV[31, 62] -> 1.0326325207209885`,
    effectiveDistance500keV[32, 61] -> 1.0546785392976248`,
    effectiveDistance500keV[33, 60] -> 1.0756039694039607`,
    effectiveDistance500keV[34, 59] -> 1.0950579405213154`,
    effectiveDistance500keV[35, 58] -> 1.1131765926637156`,
    effectiveDistance500keV[36, 57] -> 1.1292984691436263`,
    effectiveDistance500keV[37, 56] -> 1.144101012880445,
    effectiveDistance500keV[38, 55] -> 1.1568435389180314`,
    effectiveDistance500keV[39, 54] -> 1.1683103970072877`,
    effectiveDistance500keV[40, 53] -> 1.17798766744559,
    effectiveDistance500keV[41, 52] -> 1.1868331665834906`,
    effectiveDistance500keV[42, 51] -> 1.1939785583169384`,
    effectiveDistance500keV[43, 50] -> 1.2000613027554408`,
    effectiveDistance500keV[44, 49] -> 1.2047348916968776`,
    effectiveDistance500keV[45, 48] -> 1.2077965469165028`,
    effectiveDistance500keV[46, 47] -> 1.2097760558652046`,
    effectiveDistance500keV[47, 46] -> 1.2097572669022345`,
    effectiveDistance500keV[48, 45] -> 1.2078212474636698`,
    effectiveDistance500keV[49, 44] -> 1.2047060676539687`,
    effectiveDistance500keV[50, 43] -> 1.2000834331733856`,
    effectiveDistance500keV[51, 42] -> 1.1939587020411382`,
    effectiveDistance500keV[52, 41] -> 1.186842444455765,
```

```
    effectiveDistance500keV[53, 40] -> 1.1779737922846183`,
    effectiveDistance500keV[54, 39] -> 1.1683357420937472`,
    effectiveDistance500keV[55, 38] -> 1.1568301413652262`,
    effectiveDistance500keV[56, 37] -> 1.1441123519682235`,
    effectiveDistance500keV[57, 36] -> 1.1292807147381563`,
    effectiveDistance500keV[58, 35] -> 1.113201149032152,
    effectiveDistance500keV[59, 34] -> 1.095019291377996,
    effectiveDistance500keV[60, 33] -> 1.075583728336015,
    effectiveDistance500keV[61, 32] -> 1.0546518316010334`,
    effectiveDistance500keV[62, 31] -> 1.032708442977841,
    effectiveDistance500keV[63, 30] -> 1.0086896996967147`,
    effectiveDistance500keV[64, 29] -> 0.9836190359797652,
    effectiveDistance500keV[65, 28] -> 0.956609842352217,
    effectiveDistance500keV[66, 27] -> 0.8844821467979395,
    effectiveDistance500keV[67, 26] -> 0.8268885497369536,
    effectiveDistance500keV[68, 25] -> 0.7658596934201205,
    effectiveDistance500keV[69, 24] -> 0.5724706414081108,
    effectiveDistance500keV[70, 23] -> 0.21107427070488083`}};

optResult14MeVRe1 =
  {8.936997344730318*^-7, {effectiveDistance14MeV[23, 70] -> 0.13331099799591456`,
    effectiveDistance14MeV[24, 69] -> 0.41307498146390553`,
    effectiveDistance14MeV[25, 68] -> 0.7200658150737242,
    effectiveDistance14MeV[26, 67] -> 0.8673004387881311,
    effectiveDistance14MeV[27, 66] -> 0.9147191291007642,
    effectiveDistance14MeV[28, 65] -> 0.9556351625500696,
    effectiveDistance14MeV[29, 64] -> 0.9845546981923039,
    effectiveDistance14MeV[30, 63] -> 1.0116707783027485`,
    effectiveDistance14MeV[31, 62] -> 1.0376810911139285`,
    effectiveDistance14MeV[32, 61] -> 1.0618771124396575`,
    effectiveDistance14MeV[33, 60] -> 1.0850928742270944`,
    effectiveDistance14MeV[34, 59] -> 1.1066134849219087`,
    effectiveDistance14MeV[35, 58] -> 1.126710932456449,
    effectiveDistance14MeV[36, 57] -> 1.144868213038061,
    effectiveDistance14MeV[37, 56] -> 1.1616093279889332`,
    effectiveDistance14MeV[38, 55] -> 1.1760387374873127`,
    effectiveDistance14MeV[39, 54] -> 1.1888706678335357`,
    effectiveDistance14MeV[40, 53] -> 1.1998588289223595`,
    effectiveDistance14MeV[41, 52] -> 1.2096522755596761`,
    effectiveDistance14MeV[42, 51] -> 1.217554244657151,
    effectiveDistance14MeV[43, 50] -> 1.2239645845252043`,
    effectiveDistance14MeV[44, 49] -> 1.2290764847749187`,
    effectiveDistance14MeV[45, 48] -> 1.2328472236499592`,
    effectiveDistance14MeV[46, 47] -> 1.2349362768781607`,
    effectiveDistance14MeV[47, 46] -> 1.2350269039782895`,
    effectiveDistance14MeV[48, 45] -> 1.2329090941367027`,
    effectiveDistance14MeV[49, 44] -> 1.229179782684788,
    effectiveDistance14MeV[50, 43] -> 1.224043611335239,
    effectiveDistance14MeV[51, 42] -> 1.2175270488125043`,
    effectiveDistance14MeV[52, 41] -> 1.209726028683987,
    effectiveDistance14MeV[53, 40] -> 1.1999058536249492`,
    effectiveDistance14MeV[54, 39] -> 1.1888525341563223`,
    effectiveDistance14MeV[55, 38] -> 1.175989870114509,
    effectiveDistance14MeV[56, 37] -> 1.1615857187802359`,
    effectiveDistance14MeV[57, 36] -> 1.1448645226448169`,
```

```
    effectiveDistance14MeV[58, 35] -> 1.1266789793244516`,
    effectiveDistance14MeV[59, 34] -> 1.1065714882904916`,
    effectiveDistance14MeV[60, 33] -> 1.0850497816893596`,
    effectiveDistance14MeV[61, 32] -> 1.061839319592339,
    effectiveDistance14MeV[62, 31] -> 1.0375632995838213`,
    effectiveDistance14MeV[63, 30] -> 1.0116223317627533`,
    effectiveDistance14MeV[64, 29] -> 0.9844373780368324,
    effectiveDistance14MeV[65, 28] -> 0.955512098956977,
    effectiveDistance14MeV[66, 27] -> 0.9147191291004898,
    effectiveDistance14MeV[67, 26] -> 0.8673004387878003,
    effectiveDistance14MeV[68, 25] -> 0.7200658150730639,
    effectiveDistance14MeV[69, 24] -> 0.4130749814623162,
    effectiveDistance14MeV[70, 23] -> 0.1333109979926603}};

optResult0253eVRe2 =
  {7.965435259446036*^-15, {fermiEnergy0253eV[23, 70] -> 1.0000000000000002`,
    fermiEnergy0253eV[24, 69] -> 1.0000000000000526`,
    fermiEnergy0253eV[25, 68] -> 1.0000000000040445`,
    fermiEnergy0253eV[26, 67] -> 1.0000000005370844`, fermiEnergy0253eV[27, 66] ->
     1.0000000104530447`, fermiEnergy0253eV[28, 65] -> -1.19552599739035,
    fermiEnergy0253eV[29, 64] -> 0.06699277498521726, fermiEnergy0253eV[30, 63] ->
     0.19739332973993015`, fermiEnergy0253eV[31, 62] -> 1.11947266430551,
    fermiEnergy0253eV[32, 61] -> 0.7960360879362159,
    fermiEnergy0253eV[33, 60] -> 1.7539229321738854`, fermiEnergy0253eV[34, 59] ->
     2.6389883413533877`, fermiEnergy0253eV[35, 58] -> 3.806188593334561,
    fermiEnergy0253eV[36, 57] -> 3.30489501557165, fermiEnergy0253eV[37, 56] ->
     3.345447996281324, fermiEnergy0253eV[38, 55] -> 2.045797808093586,
    fermiEnergy0253eV[39, 54] -> 1.2825623960933203`,
    fermiEnergy0253eV[40, 53] -> -0.3043592615334401,
    fermiEnergy0253eV[41, 52] -> -0.2618177044664689,
    fermiEnergy0253eV[42, 51] -> -0.7442092439387669,
    fermiEnergy0253eV[43, 50] -> -0.10009690781327157`,
    fermiEnergy0253eV[44, 49] -> 0.3088161090139158,
    fermiEnergy0253eV[45, 48] -> 0.3168901029331496,
    fermiEnergy0253eV[46, 47] -> 1.0258835489617733`,
    fermiEnergy0253eV[47, 46] -> 0.9087607935401667,
    fermiEnergy0253eV[48, 45] -> -0.21087993767213772`,
    fermiEnergy0253eV[49, 44] -> -0.07974379659216964,
    fermiEnergy0253eV[50, 43] -> -0.5763526299831512,
    fermiEnergy0253eV[51, 42] -> -0.6653654143254434,
    fermiEnergy0253eV[52, 41] -> -0.05378012464215628,
    fermiEnergy0253eV[53, 40] -> -0.0782913391814502,
    fermiEnergy0253eV[54, 39] -> 1.4112104457966694`,
    fermiEnergy0253eV[55, 38] -> 2.2649920081535915`,
    fermiEnergy0253eV[56, 37] -> 3.5095990470448344`,
    fermiEnergy0253eV[57, 36] -> 3.416740487148299,
    fermiEnergy0253eV[58, 35] -> 3.771001076644275,
    fermiEnergy0253eV[59, 34] -> 2.6354820092429128`,
    fermiEnergy0253eV[60, 33] -> 1.751301897692812,
    fermiEnergy0253eV[61, 32] -> 0.9760564172769187,
    fermiEnergy0253eV[62, 31] -> 1.3988263452244365`,
    fermiEnergy0253eV[63, 30] -> -0.09535882426657867,
    fermiEnergy0253eV[64, 29] -> -0.21583119045465582`,
    fermiEnergy0253eV[65, 28] -> -1.3615211776223832`,
    fermiEnergy0253eV[66, 27] -> 1.00000000675037,
```

```
    fermiEnergy0253eV[67, 26] -> 1.0000000003345315`,
    fermiEnergy0253eV[68, 25] -> 1.0000000000024223`, fermiEnergy0253eV[69, 24] ->
     1.00000000000003, fermiEnergy0253eV[70, 23] -> 1.}};

optResult500keVRe2 =
  {1.1959637276566525`*^-14, {fermiEnergy500keV[23, 70] -> 0.9999999999999999,
    fermiEnergy500keV[24, 69] -> 0.999999999999926,
    fermiEnergy500keV[25, 68] -> 0.9999999999932048,
    fermiEnergy500keV[26, 67] -> 0.9999999991214981, fermiEnergy500keV[27, 66] ->
     0.9999999820171512, fermiEnergy500keV[28, 65] -> -0.7713937737853661,
    fermiEnergy500keV[29, 64] -> 0.1876964220776493, fermiEnergy500keV[30, 63] ->
     0.35045006036178833`, fermiEnergy500keV[31, 62] -> 1.0922199886941126`,
    fermiEnergy500keV[32, 61] -> 0.9155008883662242,
    fermiEnergy500keV[33, 60] -> 1.6195178549490281`,
    fermiEnergy500keV[34, 59] -> 2.2989449756918288`,
    fermiEnergy500keV[35, 58] -> 3.2799298302258317`,
    fermiEnergy500keV[36, 57] -> 3.0171147186933847`,
    fermiEnergy500keV[37, 56] -> 3.119824142234666,
    fermiEnergy500keV[38, 55] -> 1.9064446350974775`,
    fermiEnergy500keV[39, 54] -> 1.1674668490104039`,
    fermiEnergy500keV[40, 53] -> -0.24758210167354552`,
    fermiEnergy500keV[41, 52] -> -0.23619249041951557`,
    fermiEnergy500keV[42, 51] -> -0.7150810587908802,
    fermiEnergy500keV[43, 50] -> -0.30462718812472295`,
    fermiEnergy500keV[44, 49] -> 0.23901419373747962`,
    fermiEnergy500keV[45, 48] -> 0.48403755187880265`,
    fermiEnergy500keV[46, 47] -> 1.5618920018461147`,
    fermiEnergy500keV[47, 46] -> 1.5241794642895226`,
    fermiEnergy500keV[48, 45] -> 0.5434811839135854,
    fermiEnergy500keV[49, 44] -> 0.18868679107656583`,
    fermiEnergy500keV[50, 43] -> -0.241116270568561,
    fermiEnergy500keV[51, 42] -> -0.7374287404032156,
    fermiEnergy500keV[52, 41] -> -0.1905797804973492,
    fermiEnergy500keV[53, 40] -> -0.24781905191495798`,
    fermiEnergy500keV[54, 39] -> 1.2591106535957597`,
    fermiEnergy500keV[55, 38] -> 1.9168702412311756`,
    fermiEnergy500keV[56, 37] -> 3.19165529480574,
    fermiEnergy500keV[57, 36] -> 3.0276360903741217`,
    fermiEnergy500keV[58, 35] -> 3.3954733451644836`,
    fermiEnergy500keV[59, 34] -> 2.2697420289528027`,
    fermiEnergy500keV[60, 33] -> 1.640203232852527,
    fermiEnergy500keV[61, 32] -> 0.9256877134275961,
    fermiEnergy500keV[62, 31] -> 1.3745618441634455`,
    fermiEnergy500keV[63, 30] -> 0.24314201503898597`,
    fermiEnergy500keV[64, 29] -> 0.2046286344602379,
    fermiEnergy500keV[65, 28] -> -1.1670909651891441`,
    fermiEnergy500keV[66, 27] -> 0.9999999840024917,
    fermiEnergy500keV[67, 26] -> 0.9999999992261066,
    fermiEnergy500keV[68, 25] -> 0.9999999999940776,
    fermiEnergy500keV[69, 24] -> 0.9999999999999362,
    fermiEnergy500keV[70, 23] -> 0.9999999999999999}};

optResult14MeVRe2 =
  {7.337827354260939*^-24, {fermiEnergy14MeV[23, 70] -> 1.0000269550235612`,
    fermiEnergy14MeV[24, 69] -> 1.002095384128606,
```

```
fermiEnergy14MeV[25, 68] -> 1.0538198829162853`, fermiEnergy14MeV[26, 67] ->
 1.9770965780322773`, fermiEnergy14MeV[27, 66] -> 8.939881483911835,
fermiEnergy14MeV[28, 65] -> 2.8831123662541027`, fermiEnergy14MeV[29, 64] ->
 1.3842072514587929`, fermiEnergy14MeV[30, 63] -> -0.44905588074364194`,
fermiEnergy14MeV[31, 62] -> -0.7985464708784408, fermiEnergy14MeV[32, 61] ->
 -1.5754073814196876`, fermiEnergy14MeV[33, 60] -> -0.7252902182145465,
fermiEnergy14MeV[34, 59] -> -0.06463724588303739,
fermiEnergy14MeV[35, 58] -> 1.050945234401061,
fermiEnergy14MeV[36, 57] -> 1.4306455623652865`,
fermiEnergy14MeV[37, 56] -> 2.2811520797493223`,
fermiEnergy14MeV[38, 55] -> 1.6333114757254488`,
fermiEnergy14MeV[39, 54] -> 1.0877291114405483`,
fermiEnergy14MeV[40, 53] -> 0.11508178845988601`,
fermiEnergy14MeV[41, 52] -> 0.0875894210809139,
fermiEnergy14MeV[42, 51] -> -0.47349326069230213`,
fermiEnergy14MeV[43, 50] -> -0.7312023679818181,
fermiEnergy14MeV[44, 49] -> -0.2958885027955013,
fermiEnergy14MeV[45, 48] -> 0.735599043283732,
fermiEnergy14MeV[46, 47] -> 1.666116931698206,
fermiEnergy14MeV[47, 46] -> 1.8549107858503955`,
fermiEnergy14MeV[48, 45] -> 0.8736594297373048,
fermiEnergy14MeV[49, 44] -> -0.0644589809034716,
fermiEnergy14MeV[50, 43] -> -0.5409427232275708,
fermiEnergy14MeV[51, 42] -> -0.4951397178851264,
fermiEnergy14MeV[52, 41] -> 0.2853512741001425,
fermiEnergy14MeV[53, 40] -> 0.26620863982125736`,
fermiEnergy14MeV[54, 39] -> 1.1089371966828812`,
fermiEnergy14MeV[55, 38] -> 1.5961133198094557`,
fermiEnergy14MeV[56, 37] -> 2.3074913014964595`,
fermiEnergy14MeV[57, 36] -> 1.5107642985778962`,
fermiEnergy14MeV[58, 35] -> 1.0762761691773366`,
fermiEnergy14MeV[59, 34] -> -0.05366669587021371,
fermiEnergy14MeV[60, 33] -> -0.7077079808969866,
fermiEnergy14MeV[61, 32] -> -1.534883927735695,
fermiEnergy14MeV[62, 31] -> -0.9527465804391199,
fermiEnergy14MeV[63, 30] -> -0.4141954811224575,
fermiEnergy14MeV[64, 29] -> 1.240956279534977,
fermiEnergy14MeV[65, 28] -> 2.728458435188918, fermiEnergy14MeV[66, 27] ->
 8.447049897679927, fermiEnergy14MeV[67, 26] -> 1.9110594747998246`,
fermiEnergy14MeV[68, 25] -> 1.0498543358789072`, fermiEnergy14MeV[69, 24] ->
 1.0019267432096177`, fermiEnergy14MeV[70, 23] -> 1.0000245791637854`}};
```