

(*Nuclear Species Experimental Data*)

isotopeName = "Pu-239";

databaseName = "JENDL-5";

atomicNumber = 94; (*Atomic number*)

neutronNumber = 146; (*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*)

(*Average Number of Prompt Neutrons*)

promptNeutrons1 = 2.875; (*0.0253 eV*)

promptNeutrons2 = 3.242; (*500 keV*)

promptNeutrons3 = 4.891; (*14 MeV*)

(*Neutron Separation Energy*)

neutronSeparationEnergy = 6534.2 / 1000;

(*Charge Distribution Experimental Data JENDL-5*)

yieldData0253eV = { {23, 0}, {24, 7.3166381 * 10[^](-15)},

{25, 5.4676717 * 10[^](-12)}, {26, 7.1437793 * 10[^](-10)},

{27, 1.6420293 * 10[^](-08)}, {28, 2.6412800 * 10[^](-07)}, {29, 2.9996494 * 10[^](-06)},

{30, 2.7200965 * 10[^](-05)}, {31, 2.4485330 * 10[^](-04)}, {32, 2.3063278 * 10[^](-03)},

{33, 6.6478051 * 10[^](-03)}, {34, 1.2872625 * 10[^](-02)}, {35, 2.3876773 * 10[^](-02)},

{36, 4.2930053 * 10[^](-02)}, {37, 6.4980796 * 10[^](-02)}, {38, 1.3411421 * 10[^](-01)},

{39, 9.3592048 * 10[^](-02)}, {40, 1.9483798 * 10[^](-01)}, {41, 1.4291186 * 10[^](-01)},

{42, 1.5968751 * 10[^](-01)}, {43, 7.6504895 * 10[^](-02)}, {44, 3.9327891 * 10[^](-02)},

{45, 3.7988931 * 10[^](-03)}, {46, 9.4151286 * 10[^](-04)}, {47, 7.6307376 * 10[^](-04)},

{48, 7.9412287 * 10[^](-04)}, {49, 2.7625400 * 10[^](-03)}, {50, 4.0437365 * 10[^](-02)},

{51, 8.4456172 * 10[^](-02)}, {52, 1.7051646 * 10[^](-01)}, {53, 1.5230823 * 10[^](-01)},

{54, 1.3237486 * 10[^](-01)}, {55, 1.3979118 * 10[^](-01)}, {56, 1.2632551 * 10[^](-01)},

{57, 5.7512686 * 10[^](-02)}, {58, 4.7009220 * 10[^](-02)}, {59, 2.5038581 * 10[^](-02)},

{60, 1.4007102 * 10[^](-02)}, {61, 4.4550660 * 10[^](-03)}, {62, 1.4849786 * 10[^](-03)},

{63, 3.0752744 * 10[^](-04)}, {64, 4.4053820 * 10[^](-05)}, {65, 4.3575618 * 10[^](-06)},

{66, 3.5636091 * 10[^](-07)}, {67, 1.6307005 * 10[^](-08)}, {68, 6.2807326 * 10[^](-10)},

{69, 9.6641601 * 10[^](-12)}, {70, 2.6652547 * 10[^](-14)}, {71, 0} };

yieldData500keV = { {23, 4.6846300 * 10[^](-18)}, {24, 1.0147280 * 10[^](-13)},

{25, 5.8906585 * 10[^](-11)}, {26, 6.2047814 * 10[^](-09)}, {27, 1.4250115 * 10[^](-07)},

{28, 1.8243963 * 10[^](-06)}, {29, 1.2491091 * 10[^](-05)}, {30, 6.8411383 * 10[^](-05)},

{31, 4.2565291 * 10[^](-04)}, {32, 1.9283323 * 10[^](-03)}, {33, 5.7783508 * 10[^](-03)},

{34, 1.4623292 * 10[^](-02)}, {35, 2.3497763 * 10[^](-02)}, {36, 4.8117047 * 10[^](-02)},

{37, 6.3694259 * 10[^](-02)}, {38, 1.1550384 * 10[^](-01)}, {39, 1.2977772 * 10[^](-01)},

{40, 1.5690674 * 10[^](-01)}, {41, 1.6166132 * 10[^](-01)}, {42, 1.4919441 * 10[^](-01)},

{43, 8.3995741 * 10[^](-02)}, {44, 3.8065370 * 10[^](-02)}, {45, 4.2932437 * 10[^](-03)},

{46, 1.4722034 * 10[^](-03)}, {47, 1.2727381 * 10[^](-03)}, {48, 1.3801714 * 10[^](-03)},

{49, 4.2680381 * 10[^](-03)}, {50, 4.0115407 * 10[^](-02)}, {51, 7.7756789 * 10[^](-02)},

{52, 1.5137970 * 10[^](-01)}, {53, 1.5838174 * 10[^](-01)}, {54, 1.6293329 * 10[^](-01)},

{55, 1.3253491 * 10[^](-01)}, {56, 1.0916424 * 10[^](-01)}, {57, 6.9927519 * 10[^](-02)},

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{58, 4.5483324 * 10^(-02)}, {59, 2.4020261 * 10^(-02)}, {60, 1.3685723 * 10^(-02)},
{61, 5.6531630 * 10^(-03)}, {62, 2.2910752 * 10^(-03)}, {63, 5.7881498 * 10^(-04)},
{64, 1.2506524 * 10^(-04)}, {65, 2.4737920 * 10^(-05)}, {66, 4.7589411 * 10^(-06)},
{67, 3.7643174 * 10^(-07)}, {68, 1.6196633 * 10^(-08)}, {69, 2.9087306 * 10^(-10)},
{70, 9.4746638 * 10^(-13)}, {71, 1.2613780 * 10^(-16)}}];
yieldData14MeV = {{23, 5.8359000 * 10^(-14)}, {24, 1.0252733 * 10^(-10)},
{25, 1.5202417 * 10^(-08)}, {26, 4.0344128 * 10^(-07)}, {27, 3.0379953 * 10^(-06)},
{28, 1.6151624 * 10^(-05)}, {29, 6.8119363 * 10^(-05)}, {30, 2.5691382 * 10^(-04)},
{31, 1.0613122 * 10^(-03)}, {32, 3.8309307 * 10^(-03)}, {33, 1.0093773 * 10^(-02)},
{34, 1.9475130 * 10^(-02)}, {35, 3.1365792 * 10^(-02)}, {36, 4.5896073 * 10^(-02)},
{37, 6.3647838 * 10^(-02)}, {38, 8.5955944 * 10^(-02)}, {39, 1.0726475 * 10^(-01)},
{40, 1.2093372 * 10^(-01)}, {41, 1.2614289 * 10^(-01)}, {42, 1.1733413 * 10^(-01)},
{43, 9.4254783 * 10^(-02)}, {44, 6.8667238 * 10^(-02)}, {45, 4.4021257 * 10^(-02)},
{46, 3.4078878 * 10^(-02)}, {47, 3.3962898 * 10^(-02)}, {48, 3.7470251 * 10^(-02)},
{49, 5.0996742 * 10^(-02)}, {50, 7.5792955 * 10^(-02)}, {51, 9.4288338 * 10^(-02)},
{52, 1.1550583 * 10^(-01)}, {53, 1.3909547 * 10^(-01)}, {54, 1.2319175 * 10^(-01)},
{55, 1.0795971 * 10^(-01)}, {56, 8.2290344 * 10^(-02)}, {57, 6.1148817 * 10^(-02)},
{58, 4.2076162 * 10^(-02)}, {59, 2.7862522 * 10^(-02)}, {60, 1.7269757 * 10^(-02)},
{61, 9.4753252 * 10^(-03)}, {62, 4.6064041 * 10^(-03)}, {63, 1.8925698 * 10^(-03)},
{64, 5.9594918 * 10^(-04)}, {65, 1.2545107 * 10^(-04)}, {66, 1.9337848 * 10^(-05)},
{67, 3.3986278 * 10^(-06)}, {68, 7.5152685 * 10^(-07)}, {69, 1.0592245 * 10^(-07)},
{70, 3.9222130 * 10^(-09)}, {71, 2.0911800 * 10^(-11)}}];

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optResult0253eVRe1 =
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{2.5019421563768484`*^-14, {effectiveDistance0253eV[23, 71] -> 0.2049368234410716,
effectiveDistance0253eV[24, 70] -> 0.5685556979613773,
effectiveDistance0253eV[25, 69] -> 0.7617429530244061,
effectiveDistance0253eV[26, 68] -> 0.8197995905861205,
effectiveDistance0253eV[27, 67] -> 0.8767277231032571,
effectiveDistance0253eV[28, 66] -> 0.9482162855224898,
effectiveDistance0253eV[29, 65] -> 0.9761999120372699,
effectiveDistance0253eV[30, 64] -> 1.001201889531633,
effectiveDistance0253eV[31, 63] -> 1.0263074832038468`,
effectiveDistance0253eV[32, 62] -> 1.0485704329866055`,
effectiveDistance0253eV[33, 61] -> 1.0706185871449023`,
effectiveDistance0253eV[34, 60] -> 1.0897546762944252`,
effectiveDistance0253eV[35, 59] -> 1.1094673321207307`,
effectiveDistance0253eV[36, 58] -> 1.1256451936898524`,
effectiveDistance0253eV[37, 57] -> 1.1420754275780693`,
effectiveDistance0253eV[38, 56] -> 1.1549503081798373`,
effectiveDistance0253eV[39, 55] -> 1.1678142038697632`,
effectiveDistance0253eV[40, 54] -> 1.1775226333374589`,
effectiveDistance0253eV[41, 53] -> 1.187497714675583,
effectiveDistance0253eV[42, 52] -> 1.194584061045961,
effectiveDistance0253eV[43, 51] -> 1.2018816830714605`,
effectiveDistance0253eV[44, 50] -> 1.2059318042742757`,
effectiveDistance0253eV[45, 49] -> 1.2106376135279702`,
effectiveDistance0253eV[46, 48] -> 1.2119100384160861`,
effectiveDistance0253eV[47, 47] -> 1.2139260189022048`,
effectiveDistance0253eV[48, 46] -> 1.2118282395283841`,
effectiveDistance0253eV[49, 45] -> 1.2104845757738967`,
effectiveDistance0253eV[50, 44] -> 1.2059451126652987`,
effectiveDistance0253eV[51, 43] -> 1.2019288926498475`,

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effectiveDistance0253eV[52, 42] -> 1.1946151999646626`,
effectiveDistance0253eV[53, 41] -> 1.187527804926669,
effectiveDistance0253eV[54, 40] -> 1.1773414480720965`,
effectiveDistance0253eV[55, 39] -> 1.1680011814877418`,
effectiveDistance0253eV[56, 38] -> 1.1549227135856572`,
effectiveDistance0253eV[57, 37] -> 1.1420196232198254`,
effectiveDistance0253eV[58, 36] -> 1.1256861123303004`,
effectiveDistance0253eV[59, 35] -> 1.1094884867790444`,
effectiveDistance0253eV[60, 34] -> 1.0897916279408868`,
effectiveDistance0253eV[61, 33] -> 1.0704461988985783`,
effectiveDistance0253eV[62, 32] -> 1.0483845416639648`,
effectiveDistance0253eV[63, 31] -> 1.0264018987418357`,
effectiveDistance0253eV[64, 30] -> 1.0013969255517154`,
effectiveDistance0253eV[65, 29] -> 0.9763475229536511,
effectiveDistance0253eV[66, 28] -> 0.9483313586915598,
effectiveDistance0253eV[67, 27] -> 0.8767277231047165,
effectiveDistance0253eV[68, 26] -> 0.8197995905876636,
effectiveDistance0253eV[69, 25] -> 0.7617429530260458,
effectiveDistance0253eV[70, 24] -> 0.5685556979648868,
effectiveDistance0253eV[71, 23] -> 0.20493682345362543` } }];

optResult500keVRe1 = {1.1437476902269985`*^-12,
{effectiveDistance500keV[23, 71] -> 0.27582885029360027`,
effectiveDistance500keV[24, 70] -> 0.6062078604243899,
effectiveDistance500keV[25, 69] -> 0.7779029488914462,
effectiveDistance500keV[26, 68] -> 0.8266417257193246,
effectiveDistance500keV[27, 67] -> 0.8754266150841112,
effectiveDistance500keV[28, 66] -> 0.9338934658429592,
effectiveDistance500keV[29, 65] -> 0.9624838707414739,
effectiveDistance500keV[30, 64] -> 0.9881362115492291,
effectiveDistance500keV[31, 63] -> 1.013901001100156,
effectiveDistance500keV[32, 62] -> 1.0366897198220237`,
effectiveDistance500keV[33, 61] -> 1.0595228583108103`,
effectiveDistance500keV[34, 60] -> 1.0795381974829612`,
effectiveDistance500keV[35, 59] -> 1.0998616533257428`,
effectiveDistance500keV[36, 58] -> 1.1167872443695137`,
effectiveDistance500keV[37, 57] -> 1.1337721269839856`,
effectiveDistance500keV[38, 56] -> 1.1471933372116458`,
effectiveDistance500keV[39, 55] -> 1.1607998515832438`,
effectiveDistance500keV[40, 54] -> 1.1707629978057759`,
effectiveDistance500keV[41, 53] -> 1.1813083210628916`,
effectiveDistance500keV[42, 52] -> 1.188659721158564,
effectiveDistance500keV[43, 51] -> 1.1962903407401058`,
effectiveDistance500keV[44, 50] -> 1.20048311639866,
effectiveDistance500keV[45, 49] -> 1.2053362546702129`,
effectiveDistance500keV[46, 48] -> 1.2068305690718062`,
effectiveDistance500keV[47, 47] -> 1.2088928164947486`,
effectiveDistance500keV[48, 46] -> 1.206797458602649,
effectiveDistance500keV[49, 45] -> 1.2053332356767446`,
effectiveDistance500keV[50, 44] -> 1.2005098864560837`,
effectiveDistance500keV[51, 43] -> 1.196251042117376,
effectiveDistance500keV[52, 42] -> 1.188667076525409,
effectiveDistance500keV[53, 41] -> 1.1812980039420309`,
effectiveDistance500keV[54, 40] -> 1.170781801883305,
effectiveDistance500keV[55, 39] -> 1.1608102709532038`},

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effectiveDistance500keV[56, 38] -> 1.1471656842641305`,
effectiveDistance500keV[57, 37] -> 1.1338174071082139`,
effectiveDistance500keV[58, 36] -> 1.1167603573832852`,
effectiveDistance500keV[59, 35] -> 1.0998720129527626`,
effectiveDistance500keV[60, 34] -> 1.0795075738986983`,
effectiveDistance500keV[61, 33] -> 1.05951291051742,
effectiveDistance500keV[62, 32] -> 1.0367663214866771`,
effectiveDistance500keV[63, 31] -> 1.014034787096745,
effectiveDistance500keV[64, 30] -> 0.9883921261796725,
effectiveDistance500keV[65, 29] -> 0.96276658180647,
effectiveDistance500keV[66, 28] -> 0.9342782418707293,
effectiveDistance500keV[67, 27] -> 0.8754266150841037,
effectiveDistance500keV[68, 26] -> 0.8266417257184704,
effectiveDistance500keV[69, 25] -> 0.7779029488893692,
effectiveDistance500keV[70, 24] -> 0.6062078604213043,
effectiveDistance500keV[71, 23] -> 0.2758288502932515}};

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optResult14MeVRe1 =
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{0.00029813139204890623`, {effectiveDistance14MeV[23, 71] -> 0.02790964640240159,
  effectiveDistance14MeV[24, 70] -> 0.35531810044741585`,
  effectiveDistance14MeV[25, 69] -> 0.6983598077007617,
  effectiveDistance14MeV[26, 68] -> 0.8582177103758684,
  effectiveDistance14MeV[27, 67] -> 0.9365585770080714,
  effectiveDistance14MeV[28, 66] -> 0.9638031558551472,
  effectiveDistance14MeV[29, 65] -> 0.9932307145012972,
  effectiveDistance14MeV[30, 64] -> 1.0196793382459053`,
  effectiveDistance14MeV[31, 63] -> 1.046390501807433,
  effectiveDistance14MeV[32, 62] -> 1.0700024333207423`,
  effectiveDistance14MeV[33, 61] -> 1.0935541638468407`,
  effectiveDistance14MeV[34, 60] -> 1.113563414840919,
  effectiveDistance14MeV[35, 59] -> 1.1338025091704624`,
  effectiveDistance14MeV[36, 58] -> 1.1502933387957086`,
  effectiveDistance14MeV[37, 57] -> 1.1673017153512373`,
  effectiveDistance14MeV[38, 56] -> 1.1805399863439132`,
  effectiveDistance14MeV[39, 55] -> 1.1943959482437092`,
  effectiveDistance14MeV[40, 54] -> 1.2045448165730097`,
  effectiveDistance14MeV[41, 53] -> 1.2154161298067385`,
  effectiveDistance14MeV[42, 52] -> 1.2225840477233594`,
  effectiveDistance14MeV[43, 51] -> 1.2301169944124395`,
  effectiveDistance14MeV[44, 50] -> 1.2339256712954887`,
  effectiveDistance14MeV[45, 49] -> 1.239122399805857,
  effectiveDistance14MeV[46, 48] -> 1.2405591997314127`,
  effectiveDistance14MeV[47, 47] -> 1.2427147466580792`,
  effectiveDistance14MeV[48, 46] -> 1.2407093181134687`,
  effectiveDistance14MeV[49, 45] -> 1.2393550978695633`,
  effectiveDistance14MeV[50, 44] -> 1.2340810792877732`,
  effectiveDistance14MeV[51, 43] -> 1.230117553807619,
  effectiveDistance14MeV[52, 42] -> 1.2225595173546873`,
  effectiveDistance14MeV[53, 41] -> 1.2155681894521293`,
  effectiveDistance14MeV[54, 40] -> 1.2045733361848971`,
  effectiveDistance14MeV[55, 39] -> 1.1944058399701754`,
  effectiveDistance14MeV[56, 38] -> 1.180473993329821,
  effectiveDistance14MeV[57, 37] -> 1.1672416105862238`,
  effectiveDistance14MeV[58, 36] -> 1.1501648065482344`,
  effectiveDistance14MeV[59, 35] -> 1.1336294716421562`,

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effectiveDistance14MeV[60, 34] -> 1.1133909159314912`,
effectiveDistance14MeV[61, 33] -> 1.0934648705755052`,
effectiveDistance14MeV[62, 32] -> 1.0702572408559452`,
effectiveDistance14MeV[63, 31] -> 1.0471738282443692`,
effectiveDistance14MeV[64, 30] -> 1.0207897690232473`,
effectiveDistance14MeV[65, 29] -> 0.994016501743905,
effectiveDistance14MeV[66, 28] -> 0.9640277694239364,
effectiveDistance14MeV[67, 27] -> 0.9365585770078568,
effectiveDistance14MeV[68, 26] -> 0.8582177103755472,
effectiveDistance14MeV[69, 25] -> 0.6983598076996178,
effectiveDistance14MeV[70, 24] -> 0.3553181004455757,
effectiveDistance14MeV[71, 23] -> 0.027909646399866712`}};

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optResult0253eVRe2 = {6.8979722284691964`*^-15,
{fermiEnergy0253eV[23, 71] -> 1., fermiEnergy0253eV[24, 70] ->
  1.0000000000000027`, fermiEnergy0253eV[25, 69] -> 1.000000000000015,
fermiEnergy0253eV[26, 68] -> 1.0000000001124052`, fermiEnergy0253eV[27, 67] ->
  1.0000000009161394`, fermiEnergy0253eV[28, 66] -> -1.7050289073700269`,
fermiEnergy0253eV[29, 65] -> 0.8539124916306203,
fermiEnergy0253eV[30, 64] -> -0.9394110473987075,
fermiEnergy0253eV[31, 63] -> 1.5698770648104947`,
fermiEnergy0253eV[32, 62] -> 0.3598836924985998,
fermiEnergy0253eV[33, 61] -> 2.3785228604584376`,
fermiEnergy0253eV[34, 60] -> 0.7275195040019898,
fermiEnergy0253eV[35, 59] -> 4.08914590244298,
fermiEnergy0253eV[36, 58] -> 2.414559688919698,
fermiEnergy0253eV[37, 57] -> 4.806698579521186,
fermiEnergy0253eV[38, 56] -> 2.332923994869115,
fermiEnergy0253eV[39, 55] -> 3.2264468652262144`,
fermiEnergy0253eV[40, 54] -> 0.3158641917745552,
fermiEnergy0253eV[41, 53] -> 1.311289480021743,
fermiEnergy0253eV[42, 52] -> -0.8437792472157525,
fermiEnergy0253eV[43, 51] -> 0.6995434168223591,
fermiEnergy0253eV[44, 50] -> -1.6533434868000063`,
fermiEnergy0253eV[45, 49] -> 0.6113962852542905,
fermiEnergy0253eV[46, 48] -> -1.394222273994553,
fermiEnergy0253eV[47, 47] -> 1.3777164041406755`,
fermiEnergy0253eV[48, 46] -> -1.5759070496136434`,
fermiEnergy0253eV[49, 45] -> 0.27060265161630087`,
fermiEnergy0253eV[50, 44] -> -1.6382165135740538`,
fermiEnergy0253eV[51, 43] -> 0.7841621217830229,
fermiEnergy0253eV[52, 42] -> -0.7985461516002564,
fermiEnergy0253eV[53, 41] -> 1.3497501294559093`,
fermiEnergy0253eV[54, 40] -> -0.1240036987397036,
fermiEnergy0253eV[55, 39] -> 3.6112787001574373`,
fermiEnergy0253eV[56, 38] -> 2.225538641106629,
fermiEnergy0253eV[57, 37] -> 4.627125737564555,
fermiEnergy0253eV[58, 36] -> 2.4561115617929694`,
fermiEnergy0253eV[59, 35] -> 4.078487994118606,
fermiEnergy0253eV[60, 34] -> 0.7505819619707655,
fermiEnergy0253eV[61, 33] -> 1.867162331952717,
fermiEnergy0253eV[62, 32] -> -0.2060325696307604,
fermiEnergy0253eV[63, 31] -> 1.7311020209692642`,
fermiEnergy0253eV[64, 30] -> -0.5010972447394481,
fermiEnergy0253eV[65, 29] -> 1.1653351295031955`,

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fermiEnergy0253eV[66, 28] -> -1.4837815237869436`,
fermiEnergy0253eV[67, 27] -> 1.000000001026468,
fermiEnergy0253eV[68, 26] -> 1.0000000001271527`,
fermiEnergy0253eV[69, 25] -> 1.0000000000001712`, fermiEnergy0253eV[70, 24] ->
1.000000000000003, fermiEnergy0253eV[71, 23] -> 1.}};
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optResult500keVRe2 = {1.0785620105806087`*^-12,
{fermiEnergy500keV[23, 71] -> 1., fermiEnergy500keV[24, 70] ->
1.000000000000002`, fermiEnergy500keV[25, 69] -> 1.000000000000018,
fermiEnergy500keV[26, 68] -> 1.0000000000360392`, fermiEnergy500keV[27, 67] ->
1.000000000746885, fermiEnergy500keV[28, 66] -> 0.3675368745396066,
fermiEnergy500keV[29, 65] -> 1.809476589795249,
fermiEnergy500keV[30, 64] -> -0.8660453949054762,
fermiEnergy500keV[31, 63] -> 1.0993691661146325`,
fermiEnergy500keV[32, 62] -> -0.9259287176879181,
fermiEnergy500keV[33, 61] -> 1.19911081709253,
fermiEnergy500keV[34, 60] -> -0.05718216959933078,
fermiEnergy500keV[35, 59] -> 3.2410273091765505`,
fermiEnergy500keV[36, 58] -> 1.874438292219686,
fermiEnergy500keV[37, 57] -> 4.294326635158621,
fermiEnergy500keV[38, 56] -> 1.880741520074204,
fermiEnergy500keV[39, 55] -> 3.4504784494567793`,
fermiEnergy500keV[40, 54] -> 0.16889575137424823`,
fermiEnergy500keV[41, 53] -> 1.6741184599133425`,
fermiEnergy500keV[42, 52] -> -0.5734452564105943,
fermiEnergy500keV[43, 51] -> 1.183551959154389,
fermiEnergy500keV[44, 50] -> -1.2952366778954125`,
fermiEnergy500keV[45, 49] -> 1.0136705879782584`,
fermiEnergy500keV[46, 48] -> -0.7063356690807059,
fermiEnergy500keV[47, 47] -> 2.124870508478682,
fermiEnergy500keV[48, 46] -> -0.7959289332990276,
fermiEnergy500keV[49, 45] -> 0.9723715326188388,
fermiEnergy500keV[50, 44] -> -1.2886534619921417`,
fermiEnergy500keV[51, 43] -> 1.0267519093453374`,
fermiEnergy500keV[52, 42] -> -0.6453193479146361,
fermiEnergy500keV[53, 41] -> 1.5441262682475645`,
fermiEnergy500keV[54, 40] -> 0.08554602721387361,
fermiEnergy500keV[55, 39] -> 3.3285167599730765`,
fermiEnergy500keV[56, 38] -> 1.649890369931589,
fermiEnergy500keV[57, 37] -> 4.2132928440690005`,
fermiEnergy500keV[58, 36] -> 1.5989782861040065`,
fermiEnergy500keV[59, 35] -> 3.031952300518771,
fermiEnergy500keV[60, 34] -> -0.3942885548781423,
fermiEnergy500keV[61, 33] -> 0.8864283577828025,
fermiEnergy500keV[62, 32] -> -1.0383813551986385`,
fermiEnergy500keV[63, 31] -> 1.1178602315001254`,
fermiEnergy500keV[64, 30] -> -0.5231599819787986,
fermiEnergy500keV[65, 29] -> 2.218745401544089,
fermiEnergy500keV[66, 28] -> 1.0811508071546623`,
fermiEnergy500keV[67, 27] -> 1.0000000011238204`,
fermiEnergy500keV[68, 26] -> 1.0000000000562161`,
fermiEnergy500keV[69, 25] -> 1.0000000000000289`, fermiEnergy500keV[70, 24] ->
0.9999999999999999, fermiEnergy500keV[71, 23] -> 1.}};
```

```
optResult14MeVRe2 =
```

```

{0.0002917475909502492, {fermiEnergy14MeV[23, 71] -> 0.9999999996780523,
fermiEnergy14MeV[24, 70] -> 0.9999999829276062,
fermiEnergy14MeV[25, 69] -> 0.9999998425323707,
fermiEnergy14MeV[26, 68] -> 0.9999971500140046, fermiEnergy14MeV[27, 67] ->
0.9999887574092629, fermiEnergy14MeV[28, 66] -> -3.704394348937919,
fermiEnergy14MeV[29, 65] -> -0.6869684563514825, fermiEnergy14MeV[30, 64] ->
-1.7273328559566024`, fermiEnergy14MeV[31, 63] -> 1.9170526458274675`,
fermiEnergy14MeV[32, 62] -> 1.4382497898700615`, fermiEnergy14MeV[33, 61] ->
4.5641337343644395`, fermiEnergy14MeV[34, 60] -> 2.785233228225616,
fermiEnergy14MeV[35, 59] -> 5.174876660189472, fermiEnergy14MeV[36, 58] ->
2.4482134468611587`, fermiEnergy14MeV[37, 57] -> 4.400965962078503,
fermiEnergy14MeV[38, 56] -> 1.3852501197014526`,
fermiEnergy14MeV[39, 55] -> 3.120516239019657, fermiEnergy14MeV[40, 54] ->
0.16271844962557983`, fermiEnergy14MeV[41, 53] -> 2.0530411809232763`,
fermiEnergy14MeV[42, 52] -> -0.6493241947390485, fermiEnergy14MeV[43, 51] ->
0.6532095795208267, fermiEnergy14MeV[44, 50] -> -2.610800644135023,
fermiEnergy14MeV[45, 49] -> 0.2001198348254674, fermiEnergy14MeV[46, 48] ->
-1.6035427972681628`, fermiEnergy14MeV[47, 47] -> 1.2414606272450286`,
fermiEnergy14MeV[48, 46] -> -1.3331768576473286`,
fermiEnergy14MeV[49, 45] -> 0.601574917127547,
fermiEnergy14MeV[50, 44] -> -2.407467910220492,
fermiEnergy14MeV[51, 43] -> 0.49349444004688875`,
fermiEnergy14MeV[52, 42] -> -0.9034864147686428,
fermiEnergy14MeV[53, 41] -> 2.1299172597865272`,
fermiEnergy14MeV[54, 40] -> -0.0652234285094903,
fermiEnergy14MeV[55, 39] -> 2.8074924068269462`,
fermiEnergy14MeV[56, 38] -> 0.8585788799341995,
fermiEnergy14MeV[57, 37] -> 3.8362554021797095`,
fermiEnergy14MeV[58, 36] -> 1.6737747506459855`,
fermiEnergy14MeV[59, 35] -> 4.237816427820088,
fermiEnergy14MeV[60, 34] -> 1.7821339178725502`,
fermiEnergy14MeV[61, 33] -> 3.6918522900915853`,
fermiEnergy14MeV[62, 32] -> 1.352298850790464,
fermiEnergy14MeV[63, 31] -> 3.1349519702263358`,
fermiEnergy14MeV[64, 30] -> 0.35278230598985966`,
fermiEnergy14MeV[65, 29] -> 0.5201623619956215,
fermiEnergy14MeV[66, 28] -> -4.106409512480741,
fermiEnergy14MeV[67, 27] -> 0.999984554170986,
fermiEnergy14MeV[68, 26] -> 0.9999959756661728,
fermiEnergy14MeV[69, 25] -> 0.9999997708293414,
fermiEnergy14MeV[70, 24] -> 0.9999999743057367,
fermiEnergy14MeV[71, 23] -> 0.9999999994968758}};

```