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TABLES OF NUCLEAR LEVEL DENSITY PARAMETERS

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PREFACE

The development of the idea of deformed momentum distribution as a result of realistic nuclear interactions amongst constituent nucleons has led us to an analytic solution of the phase space integral under plausible approximations. Out of such an exercise came the solution of the problem of the nuclear single particle level density parameter at the nuclear Fermi surface by parametrising the interactions from what we call the Renormalised Gas Model (RGM).

Need has been felt for some time to report our predicted single particle level density parameters (the so called a-parameters). They are expected to be of value in experimental nuclear reaction work - particularly in the analysis and evaluation of existing data - and for theoretical estimation of compound nuclear yields, cross sections and distributions. Contacts with many scientific laboratories have led us to believe that it is indeed desirable to put our predictions in a tabular form. This has been done here in three tables covering the range of nucleides $9 \leq Z \leq 126$ ($15 \leq A \leq 338$).

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A. Chatterjee.

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TABLES OF NUCLEAR LEVEL DENSITY PARAMETERS

I N D E X

1. NUCLEAR LEVEL DENSITY PARAMETERS

1.1. INTRODUCTION :

All applications of the nuclear statistical model require the knowledge of nuclear level densities. A recent renewed interest in the problem has grown for several reasons. The experimental data are now more refined than in the past and encompass many more reaction channels involving newer elements as targets and projectiles at extended machine energies. They provide suitable testing grounds for existing formalisms. Reliable predictions are necessary for applied programmes, e.g., unknown cross sections, yields and excitation functions. Several related statistical quantities, e.g., the nuclear temperature T, the moment of inertia I, the spin cut-off factor σ^2, the angular momentum distributions, etc., depend on the form of the level density. Hence the problem is of utmost importance both from theoretical and practical viewpoints, and merits further studies.

A crucial parameter entering the level density formulations is the so-called nuclear single particle level density parameter a_F, or the physically more meaningful quantity, the single particle density of states $g_F = 6a_F/\pi^2$ at the nuclear Fermi surface ε_F. A proper definition of g_F or a_F is necessary for the description and studies of the level densities. All statistical quantities mentioned above are usually expressed in terms of two basic quantities, $a_F = \pi^2 g_F/6$ at ε_F, and the excitation energy U of the system measured from ε_F.

1.2. A BRIEF SUMMARY OF BETHE'S FREE FERMI GAS MODEL :

In the Bethe formulation[1], the integration over the isotropic momentum distribution of a system of A independent (noninteracting) nucleons moving inside the nuclear volume, using the constraints

of particle and energy conservation, gives the phase space solutions for the free Fermi energy $\mathcal{E}_o$ and the corresponding single particle level density g_o of equidistant spacings as

$$\mathcal{E}_o = (9\pi/8)^{2/3} \cdot h^2/2Mr_o^2 \ , \quad \text{for } N = Z = A/2 \tag{1}$$

$$g_o = 3A/2\mathcal{E}_o \ , \qquad a_o = \pi^2 g_o/6 = \pi^2 A/4\mathcal{E}_o \ , \tag{2}$$

where M is the nucleon mass with radius constant r_o. The numerical value of $\mathcal{E}_o$ is 31 - 36 MeV for $M = 1.67 \times 10^{-24}$ g and r_o = 1.17 - 1.25 fm. The level density parameter a_o is predicted to vary linearly with mass number A with a slope constant $\pi^2/4\mathcal{E}_o$ = 1/13 = 0.077 .

1.3. COMPARISON WITH EXPERIMENTS :

Experimentalists had used a_o-values with only moderate success but the Bethe model is still of value for order-of-magnitude estimates of level densities required in compound nuclear reaction phenomena. It is, however, well known that the simple linearity of a_o is completely destroyed due to local fluctuations in many mass regions and that a few dominant effects of nuclear structure appear to stand out clearly in the observed systematics of a_F with A, e.g. in the actual level counting analysis[2-5] in slow neutron resonances (excitation energy U about 6 MeV), and in many reaction channels at elevated energies.

The observed gross average slope covering the entire stable mass region, very crudely stated, is about 80 - 100 % higher than a_o. The measured a_F - values often go lower than the a_o-values for singly magic configurations and indeed attain very low values near the doubly magic positions. The midshell nuclei often need 100 - 120% increase over a_o to fit the experimental reaction cross section data. In regions of permanently deformed nuclei (rare earths and actinides), the gross average slope is seen to be about 40 - 60 % higher than the locally expected a_o-values. The early literature

thus abounds in quite arbitrary and uncorrelated choices of values of a_F with local slope constants ranging from 1/5 to 1/24 .

1.4. THEORETICAL ATTEMPTS TO REPRODUCE EXPERIMENTAL a-PARAMETERS :

The earliest attempts to remove the deficiencies of the Bethe model of free Fermions are the well known work of the Canadians Newton and Cameron. Newton[6] averaged the free gas spacings in terms of average angular momenta of shell model states, while Cameron[7] averaged the single particle spacings with his empirically introduced shell and pairing fynctions defined from his mass formula. Many concepts introduced by them in this context has gained wide acceptance. The work of Baba[5] for example partly follows their lines of extracting the a-values from nuclear reaction data. Side by side, several examples of semi-empirical excercise appear[2-4] to justify their basis on theoretical arguments; some of them use specific models[4].

Among later workers, Meyers and Swiatecki[8] and Strutinski[9] touch upon the subject. Meyers and Swiatecki consider the change in Fermi energy due to shell bunching of states while developing a semi-empirical mass formula. Strutinski consider an average shell correction over the liquid drop potential energy surface in the distribution of the single particle density of states in regions of high deformation.

A recent development of the subject[10,11] introduces the concept of deformed momentum space as a result of residual nuclear interactions amongst A constitutnt nucleons, and solves the phase space integral analytically in a closed form. The resultant density is

$$g_F = 2g_o(\varepsilon_F/\varepsilon_o)(1 - \tfrac{1}{2}\alpha_2)\lambda^{-3}(1 - 2E_\beta/\varepsilon_F) \qquad (3)$$

where α_2 is the momentum deformation parameter λ is its volume-conserving parameter. E_β is the ground state deformation energy of the nucleus. The quantities g_F, g_o, ε_F and ε_o are the same in Secs. 1.1 and 1.2. One needs to fix α_2 , E_β and λ from a model

in which $\mathcal{E}_F$ has to be defined and has to be related to $\mathcal{E}_o$. This, in the work presented here, is done with the help of the Renormalised Gas Model[12] (RGM). Since the later part of this work uses Eq.(3) and the RGM, the features of the RGM are briefly summarised below.

1.5. THE RENORMALISED GAS MODEL :

The RGM uses $\mathcal{E}_o$ in Eq.(1) as the reference energy from which all nuclear interactions are measured and their energy contributions are algebraically added. The interactions themselves are of statistical nature but are analytic in form; they represent effects of nuclear shell structure, pairing and shape deformation. The shell interaction is assumed to be that of Rosenzweig[13] and the pairing and deformation interaction energies, Δ^2/G and E_β respectively, are introduced after Belyaev[14]. The total interaction energy is

$$\delta\mathcal{E} = \mathcal{E}_F - \mathcal{E}_o = f - \Delta^2/G - E_\beta \qquad (4)$$

to define the effective Fermi surface $\mathcal{E}_F$ shifted from $\mathcal{E}_o$. The specific forms of f , Δ^2/G and E_β , particularly in cases where considerable subshell mixing exists, have been discussed in a set of publications[11,12] and the averaging and renormalisation proceedures have been elaborated; they need not be repeated here. It is only necessary to note that the model does not contain any free parameters. Detailed comparison in compound nuclear reaction channels and in nuclear fission phenomena has indicated adequately the validity and utility of the model.

1.6. ORGANISATION OF THE PRESENT WORK :

It has been stressed that the virtue of the RGM formulation is that all nuclear interactions used are analytic in form and are, in general, free of arbitrary parameters. The predictions that follow therefore do not need any experimental input information. It suffices to use a realistic and apppopriate shell model level scheme. In what follows, only the Nilsson level scheme[15] has been consistently used.

While using this level scheme, only a part of the spectrum of shell model states within a major shell is needed as input information, intershell mixing being completely disregarded ; within a shell, the local subshells contribute most to the RGM interaction energies; a judicious choice of the ground state is often necessary. Apart from this, relatively little attention need to be paid to the vacant subshells in the spectrum. In this sense, the actual number of total input information is relatively small. Neutrons and protons have been separately treated. In regions where considerable inter-shell and subshell mixing is known to exist, some amount of arbitrariness enters in defining the interaction terms of Eq.(4). In these regions, a definite mixing scheme in terms of the degeneracy numbers and their relative contributions have been consistently adopted. The procedure has been discussed in Eqs. (42)-(51) in ref.[11] .

Keeping these comments (the desirable features and limitations of the RGM) in mind, it is possible to use the model to calculate a very large set of single particle level density parameters. This has been done in the present work. Predictions of a_F - values of more than 2000 nucleides are presented here in three parts in tabular form over the range $9 \leq Z \leq 126$ ($15 \leq A \leq 338$).

The division of the information in three parts is somewhat arbitrary. The elements on or near the valley of beta-stability are shown upto A = 192 in Table 1 (see Sec. 2.1). Neutron-rich fission fragment nucleides are entered in Table 2 (see Sec. 3.1) . The transitional nuclei, actinides and light-mass super heavy elements are presented in Table 3 (see Sec. 4.1).

An extensive comparison with the available experimental data[2-5] has been made. The experimental data analyses are often not consistent amongst themselves. In such cases, we have rather arbitrarily given more weight to the later extensive work of Baba[5] and find a satisfactory agreement with his experimental numbers.

Each Table consists of seven columns. The first three identify the nucleus in terms of its constituent Z and N . The fourth

column is the RGM deformation energy of binding E_β calculated by the method developed by Mukherjee[12]. The fifth column is the total RGM structural energy correction $\delta\mathcal{E}$ over the free gas Fermi surface $\mathcal{E}_0$ to define the effective Fermi surface $\mathcal{E}_F$ of the model system. Column 6 enters the a_0- values for reference. The last column gives the a_F - values predicted from the RGM.

1.7. REFERENCES :

1. H. A. Bethe, Phys. Rev. 47(1935)633; 47(1935)747; 50(1936)332; 50(1936)977; Rev. Mod. Phys. 9(1937)69;
   T. Ericson, Advances in Phys. (Phil. Mag. Suppl.) 9(1960)425;
   A. Bohr and B. R. Mottelson, Nuclear Structure (Benjamin, New York, 1969) Vol. 1, Chap. 2, p.281.

2. E. Erba, U. Facchini and E. Saetta-Menichella, Nuovo Cimento 22(1961)123; U. Facchini, private comm.;
   U. Facchini and E. Saetta-Menichella, Energ. Nucl.15(1968)24

3. A. A. Ross, Phys. Rev. 108(1957)720.

4. D. W. Lang, Nucl. Phys. 26(1961)434; 42(1963)353;
   W. Dilg, W. Schantl, H. Vonach and M. Uhl, Nucl. Phys. A217(1973)269.

5. H. Baba, Nucl. Phys. A159(1970)625.

6. T. D. Newton, Canad. J. Phys. 34(1956)804; 35(1957)1400.

7. A. G. W. Cameron, Canad. J. Phys. 36(1958)1040.

8. W. D. Meyers and W. J. Swiatecki, Nucl. Phys. 81(1966)1 .

9. V. M. Strutinski, Nucl. Phys. A95(1967)120;
   V. M. Strutinski and H. C. Pauli, Proc. Intern. Symp. on Physics and Chemistry of Fission (I.A.E.A, Vienna,1969) p.155.

10. S. K. Ghosh, S. Mukherjee and A. Chatterjee, Phys. Lett. 38B(1972)203

11. S. K. Ghosh and A. Chatterjee, Phys. Rev. C7(1973)840; C8(1973)

12. R. Sarkar and A. Chatterjee, Phys. Lett. 30B(1969)313; 33B(1971)263; Phys. Rev. C1(1970)619; C4(1971)944; Proc. Intern. Conf. on Statistical Properties of Nuclei, Albany, 1971;
A. Chatterjee, Intern. At. Energy Agency Report No. INDC-7/U;
S. Chatterjee, Nucl. Phys. A143(1970)277
S. Chatterjee and A. Chatterjee, Nucl. Phys. A129(1969) ;Proc. Intern. Conf. on Statistical Properties of Nuclei, Albany, 1971;
Ph.D. Dissertations of R. Sarkar, S. Mukherjee and S. K. Ghosh (unpublished) submitted to Calcutta University, 1971-73.

13. N. Rosenzweig, Phys. Rev. 105(1957)950; 108(1957)817;
N. Rosenzweig, L. M. Bollinger, L. L. Lee and J. P. Schiffer, Proc. Second U.N. Conference on the Peaceful Uses of Atomic Energy, Geneva, 1958 (United Nations, Geneva, 1958) p. 11.

14. S. T. Belyaev, Kgl. Dansk. Vid. Selskab. Mat. Fys. Medd. 31 , No. 11 (1959).

15. S. G. Nilsson, R. Nix, A. Sobiczewski, Z. Szymanski, S. Wycech, C. Gustafson and P. Moller, Nucl. Phys. A115(1968)545;
S. G. Nilsson, C. F. Tsang, A. Sobiczewski, Z. Szymanski, S. Wycech, C. Gustafson, I.-L. Lamm, P. Møller and B. Nilsson, Nucl. Phys. A131(1969) 1;
A. Sobiczewski, Z. Szymanski, S. Wycech, S. G. Nilsson, J. R. Nix, C. F. Tsang, C. Gustafson, P. Møller and B. Nilsson, Nucl. Phys. A131(1969)67.

2. LEVEL DENSITY PARAMETERS FOR $9 \leq Z \leq 75$ ($15 \leq A \leq 192$)

2.1. FOREWARD :

Information on light and medium weight nuclei from mass 15 to 192 are presented in the following pages (pp. 2.2 - 2.28). These constitute a group of relatively simple structures. In the first half of the group, Coulomb corrections to our model deformation energy are not significant in magnitude. In the rare earth region the existence of permanent deformation is relatively simple to treat as higher order deformations do not interfere significantly. Our results have already been published in graphical form in ref[1]. With only minor changes in the present computation, the results shown in Table 1 are essentially the same as in ref[1].

The very light nuclei, having the simplest shell model structures, are not so simple to treat in our model due to the uncertainties involved in Belyaev treatment for nuclei with not-too-many particles. This is why they were emitted in ref[1]. Whether the estimates of our model deformation energies in this region are realistic or not needs further investigation. The fact that our predicted a-parameters fairly agree with the available experimental data seems to indicate that the binding effect due to our model deformation tends to cancel in part with even larger Rosenzweig unbinding effect.

2.2. REFERENCES :

1. S. K. Ghosh, S. Mukherjee and A. Chatterjee, Phys. Lett. 38B(1972)203; S. K. Ghosh and A. Chatterjee, Phys. Rev. C7(1973)840; C8(1973)423; compare with refs.[2-5] in Sec. 1.7 .

2.3. THE TABLE (TABLE 1) :

Comments in Sec. 1.6 may be noted; the symbol headings are fully explained there.

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
9	6	15	5.189	-8.942	1.192	0.981
	7	16	2.548	-0.169	1.272	2.194
	8	17	1.587	-3.420	1.351	2.264
	9	18	3.280	-1.853	1.431	2.221
	10	19	3.518	-0.563	1.510	2.405
9	11	20	3.560	4.206	1.590	2.850
	12	21	3.781	-0.101	1.669	2.646
	13	22	4.230	0.965	1.749	2.773
	14	23	4.826	-5.754	1.828	2.012
	15	24	2.524	2.892	1.908	3.529
10	7	17	2.741	0.263	1.351	2.328
	8	18	1.780	-2.988	1.431	2.397
	9	19	3.473	-1.420	1.510	2.344
	10	20	3.710	-0.130	1.590	2.530
	11	21	3.753	4.638	1.669	2.985
10	12	22	3.974	0.331	1.749	2.770
	13	23	4.423	1.398	1.828	2.897
	14	24	5.019	-5.321	1.908	2.105
	15	25	2.717	3.324	1.987	3.667
	16	26	2.666	0.512	2.067	3.601
11	8	19	1.806	2.298	1.510	2.869
	9	20	3.499	3.866	1.590	2.841
	10	21	3.737	5.155	1.669	3.014
	11	22	3.779	9.925	1.749	3.313
	12	23	4.000	5.618	1.828	3.282
11	13	24	4.449	6.684	1.908	3.404
	14	25	5.045	-0.034	1.987	2.849
	15	26	2.744	8.611	2.067	4.033
	16	27	2.693	5.799	2.146	4.107
	17	28	3.061	6.511	2.226	4.225
12	9	21	3.703	-1.159	1.669	2.567
	10	22	3.941	0.129	1.749	2.759
	11	23	3.983	4.899	1.828	3.244
	12	24	4.204	0.592	1.908	2.995
	13	25	4.653	1.658	1.987	3.121

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
12	14	26	5.249	-5.060	2.067	2.251
	15	27	2.948	3.585	2.146	3.931
	16	28	2.897	0.773	2.226	3.847
	17	29	3.265	1.485	2.305	3.963
	18	30	2.938	-0.128	2.385	4.012
13	10	23	4.369	1.882	1.828	2.951
	11	24	4.411	6.651	1.908	3.409
	12	25	4.632	2.344	1.987	3.191
	13	26	5.081	3.411	2.067	3.314
	14	27	5.677	-3.308	2.146	2.465
13	15	28	3.375	5.337	2.226	4.104
	16	29	3.325	2.525	2.305	4.047
	17	30	3.692	3.237	2.385	4.161
	18	31	3.365	1.623	2.464	4.224
	19	32	2.982	1.284	2.544	4.430
14	11	25	4.994	-0.620	1.987	2.796
	12	26	5.215	-4.927	2.067	2.280
	13	27	5.664	-3.861	2.146	2.390
	14	28	6.260	-10.580	2.226	1.225
	15	29	3.959	-1.934	2.305	3.371
14	16	30	3.908	-4.746	2.385	3.088
	17	31	4.276	-4.034	2.464	3.182
	18	32	3.949	-5.648	2.544	3.128
	19	33	3.566	-5.988	2.623	3.304
	20	34	3.021	-8.635	2.703	3.116
15	11	26	2.842	9.015	2.067	4.026
	12	27	3.063	4.708	2.146	3.981
	13	28	3.512	5.774	2.226	4.103
	14	29	4.108	-0.944	2.305	3.457
	15	30	1.806	7.701	2.385	4.781
15	16	31	1.756	4.889	2.464	4.858
	17	32	2.124	5.601	2.544	4.974
	18	33	1.796	3.987	2.623	5.110
	19	34	1.413	3.647	2.703	5.332
	20	35	0.869	1.000	2.782	5.420

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
16	11	27	2.799	5.926	2.146	4.094
	12	28	3.020	1.619	2.226	3.898
	13	29	3.469	2.685	2.305	4.027
	14	30	4.065	-4.033	2.385	3.147
	15	31	1.763	4.612	2.464	4.842
16	16	32	1.712	1.800	2.544	4.814
	17	33	2.080	2.512	2.623	4.932
	18	34	1.753	0.898	2.703	5.017
	19	35	1.370	0.558	2.782	5.238
	20	36	0.826	-2.088	2.862	5.242
16	21	37	3.522	-0.388	2.941	4.709
	22	38	4.218	3.538	3.021	5.141
	23	39	4.258	5.921	3.100	5.519
	24	40	4.205	6.473	3.180	5.725
	25	41	4.146	5.338	3.259	5.779
17	12	29	3.363	2.576	2.305	4.042
	13	30	3.812	3.642	2.385	4.168
	14	31	4.408	-3.076	2.464	3.289
	15	32	2.106	5.569	2.544	4.976
	16	33	2.055	2.757	2.623	4.959
17	17	34	2.423	3.469	2.703	5.075
	18	35	2.096	1.855	2.782	5.165
	19	36	1.713	1.515	2.862	5.388
	20	37	1.169	-1.131	2.941	5.400
	21	38	3.865	0.568	3.021	4.859
17	22	39	4.561	4.495	3.100	5.280
	23	40	4.601	6.878	3.180	5.648
	24	41	4.548	7.430	3.259	5.851
	25	42	4.489	6.295	3.339	5.910
	26	43	4.217	3.875	3.418	5.863
18	13	31	3.509	1.807	2.464	4.205
	14	32	4.105	-4.911	2.544	3.198
	15	33	1.803	3.734	2.623	5.092
	16	34	1.753	0.922	2.703	5.019
	17	35	2.121	1.634	2.782	5.136

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
18	18	36	1.793	0.020	2.862	5.199
	19	37	1.411	-0.319	2.941	5.424
	20	38	0.866	-2.965	3.021	5.393
	21	39	3.563	-1.266	3.100	4.804
	22	40	4.258	2.660	3.180	5.282
18	23	41	4.298	5.043	3.259	5.700
	24	42	4.245	5.595	3.339	5.915
	25	43	4.186	4.460	3.418	5.947
	26	44	3.915	2.040	3.498	5.848
	27	45	3.002	-1.070	3.577	5.824
19	14	33	3.751	-4.884	2.623	3.429
	15	34	1.449	3.761	2.703	5.331
	16	35	1.398	0.949	2.782	5.270
	17	36	1.766	1.661	2.862	5.387
	18	37	1.439	0.047	2.941	5.459
19	19	38	1.056	-0.291	3.021	5.688
	20	39	0.512	-2.938	3.100	5.667
	21	40	3.208	-1.239	3.180	5.070
	22	41	3.904	2.687	3.259	5.543
	23	42	3.944	5.070	3.339	5.956
19	24	43	3.891	5.622	3.418	6.171
	25	44	3.832	4.487	3.498	6.210
	26	45	3.560	2.067	3.577	6.124
	27	46	2.647	-1.043	3.657	6.112
	28	47	0.512	-4.119	3.736	6.610
20	15	35	0.937	1.189	2.782	5.419
	16	36	0.886	-1.622	2.862	5.282
	17	37	1.254	-0.910	2.941	5.401
	18	38	0.927	-2.524	3.021	5.436
	19	39	0.544	-2.864	3.100	5.666
20	20	40	0.000	-5.511	3.180	5.588
	21	41	2.696	-3.812	3.259	4.933
	22	42	3.392	0.115	3.339	5.481
	23	43	3.432	2.498	3.418	5.959
	24	44	3.379	3.050	3.498	6.191

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
20	25	45	3.320	1.915	3.577	6.194
	26	46	3.048	-0.504	3.657	6.038
	27	47	2.135	-3.615	3.736	5.965
	28	48	0.000	-6.692	3.816	6.450
	29	49	0.279	-4.285	3.895	6.966
20	30	50	0.468	-3.210	3.975	7.233
	31	51	0.612	-1.794	4.054	7.575
	32	52	0.742	-2.642	4.134	7.504
	33	53	1.139	-0.644	4.213	7.836
	34	54	1.133	-0.365	4.293	8.035
21	19	40	3.074	-0.998	3.180	5.161
	20	41	2.530	-3.645	3.259	5.035
	21	42	5.226	-1.946	3.339	4.331
	22	43	5.922	1.980	3.418	4.910
	23	44	5.962	4.364	3.498	5.417
21	24	45	5.909	4.915	3.577	5.647
	25	46	5.850	3.780	3.657	5.612
	26	47	5.578	1.360	3.736	5.399
	27	48	4.666	-1.750	3.816	5.275
	28	49	2.530	-4.826	3.895	5.741
22	19	41	3.686	3.012	3.259	5.661
	20	42	3.141	0.365	3.339	5.617
	21	43	5.838	2.064	3.418	4.959
	22	44	6.533	5.991	3.498	5.445
	23	45	6.573	8.374	3.577	5.865
22	24	46	6.521	8.926	3.657	6.074
	25	47	6.462	7.791	3.736	6.095
	26	48	6.190	5.371	3.816	5.981
	27	49	5.277	2.260	3.895	5.950
	28	50	3.141	-0.815	3.975	6.457
22	29	51	3.421	1.590	4.054	6.919
	30	52	3.610	2.665	4.134	7.156
	31	53	3.754	4.081	4.213	7.455
	32	54	3.884	3.233	4.293	7.404
	33	55	4.281	5.231	4.372	7.681

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
23	23	46	6.589	10.782	3.657	6.223
	24	47	6.536	11.334	3.736	6.415
	25	48	6.477	10.199	3.816	6.480
	26	49	6.205	7.779	3.895	6.448
	27	50	5.293	4.668	3.975	6.495
23	28	51	3.157	1.592	4.054	7.036
	29	52	3.436	3.998	4.134	7.431
	30	53	3.625	5.073	4.213	7.642
	31	54	3.770	6.489	4.293	7.894
	32	55	3.900	5.641	4.372	7.892
24	21	45	5.801	5.024	3.577	5.705
	22	46	6.496	8.951	3.657	6.085
	23	47	6.536	11.334	3.736	6.415
	24	48	6.483	11.886	3.816	6.603
	25	49	6.424	10.751	3.895	6.678
24	26	50	6.153	8.331	3.975	6.667
	27	51	5.240	5.220	4.054	6.735
	28	52	3.104	2.144	4.134	7.290
	29	53	3.383	4.550	4.213	7.670
	30	54	3.572	5.625	4.293	7.873
24	31	55	3.717	7.041	4.372	8.115
	32	56	3.847	6.193	4.452	8.124
	33	57	4.244	8.191	4.531	8.323
	34	58	4.238	8.471	4.611	8.495
	35	59	4.249	10.331	4.690	8.758
25	27	52	5.196	4.070	4.134	6.695
	28	53	3.060	0.994	4.213	7.248
	29	54	3.339	3.400	4.293	7.670
	30	55	3.528	4.475	4.372	7.889
	31	56	3.673	5.891	4.452	8.157
26	25	51	6.151	7.138	4.054	6.646
	26	52	5.879	4.718	4.134	6.504
	27	53	4.967	1.607	4.213	6.451
	28	54	2.831	-1.468	4.293	6.988
	29	55	3.110	0.937	4.372	7.486

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
26	30	56	3.299	2.012	4.452	7.736
	31	57	3.444	3.428	4.531	8.053
	32	58	3.574	2.580	4.611	7.984
	33	59	3.971	4.578	4.690	8.279
	34	60	3.965	4.858	4.770	8.466
27	28	55	2.005	-4.666	4.372	6.785
	29	56	2.285	-2.260	4.452	7.356
	30	57	2.474	-1.185	4.531	7.634
	31	58	2.618	0.230	4.611	8.001
	32	59	2.748	-0.617	4.690	7.883
27	33	60	3.145	1.380	4.770	8.241
	34	61	3.139	1.660	4.849	8.439
	35	62	3.150	3.520	4.929	8.919
	36	63	3.190	2.235	5.008	8.806
	37	64	3.262	2.751	5.088	9.009
28	27	55	2.135	-4.796	4.372	6.678
	28	56	0.000	-7.873	4.452	7.207
	29	57	0.279	-5.466	4.531	7.817
	30	58	0.468	-4.391	4.611	8.115
	31	59	0.612	-2.975	4.690	8.510
28	32	60	0.742	-3.823	4.770	8.379
	33	61	1.139	-1.825	4.849	8.768
	34	62	1.133	-1.546	4.929	8.978
	35	63	1.144	0.314	5.008	9.500
	36	64	1.184	-0.970	5.088	9.368
28	37	65	1.256	-0.455	5.167	9.585
	38	66	1.359	-2.944	5.247	9.067
	39	67	0.511	0.614	5.326	10.494
	40	68	0.508	-0.522	5.406	10.438
29	29	58	0.619	-1.651	4.611	8.640
	30	59	0.808	-0.576	4.690	8.901
	31	60	0.952	0.839	4.770	9.228
	32	61	1.082	-0.008	4.849	9.170
	33	62	1.479	1.989	4.929	9.469

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
29	34	63	1.473	2.269	5.008	9.668
	35	64	1.484	4.130	5.088	10.062
	36	65	1.524	2.844	5.167	10.037
	37	66	1.596	3.360	5.247	10.230
	38	67	1.699	0.871	5.326	9.911
29	39	68	0.851	4.429	5.406	10.996
	40	69	0.848	3.292	5.485	11.039
30	29	59	0.835	-1.641	4.690	8.680
	30	60	1.024	-0.566	4.770	8.945
	31	61	1.169	0.849	4.849	9.280
	32	62	1.299	0.001	4.929	9.211
	33	63	1.696	1.999	5.008	9.519
30	34	64	1.690	2.279	5.088	9.719
	35	65	1.701	4.140	5.167	10.127
	36	66	1.741	2.854	5.247	10.089
	37	67	1.813	3.370	5.326	10.284
	38	68	1.915	0.881	5.406	9.939
30	39	69	1.068	4.440	5.485	11.066
	40	70	1.065	3.302	5.565	11.099
	41	71	2.787	0.776	5.644	9.826
31	33	64	1.851	2.983	5.088	9.750
	34	65	1.845	3.263	5.167	9.946
	35	66	1.856	5.123	5.247	10.324
	36	67	1.896	3.838	5.326	10.310
	37	68	1.968	4.353	5.406	10.498
31	38	69	2.071	1.864	5.485	10.198
	39	70	1.223	5.423	5.565	11.248
	40	71	1.220	4.286	5.644	11.303
	41	72	2.942	1.759	5.724	10.105
	42	73	2.635	1.935	5.803	10.472
31	43	74	2.401	4.341	5.883	11.201
	44	75	2.219	3.442	5.962	11.303
	45	76	2.065	4.575	6.042	11.714
32	33	65	1.979	1.198	5.167	9.529
	34	66	1.973	1.478	5.247	9.734
	35	67	1.984	3.339	5.326	10.196
	36	68	2.024	2.053	5.406	10.111
	37	69	2.096	2.569	5.485	10.315

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
32	38	70	2.198	0.080	5.565	9.879
	39	71	1.351	3.639	5.644	11.164
	40	72	1.348	2.501	5.724	11.154
	41	73	3.070	-0.024	5.803	9.704
	42	74	2.763	0.150	5.883	10.092
32	43	75	2.529	2.556	5.962	10.957
	44	76	2.347	1.657	6.042	11.018
	45	77	2.193	2.791	6.121	11.498
	46	78	2.041	1.113	6.201	11.375
33	36	69	2.479	3.440	5.485	10.265
	37	70	2.551	3.956	5.565	10.462
	38	71	2.654	1.467	5.644	10.070
	39	72	1.806	5.026	5.724	11.275
	40	73	1.803	3.888	5.803	11.287
33	41	74	3.525	1.362	5.883	9.912
	42	75	3.218	1.537	5.962	10.294
	43	76	2.984	3.943	6.042	11.113
	44	77	2.802	3.044	6.121	11.187
	45	78	2.648	4.177	6.201	11.642
33	46	79	2.496	2.500	6.280	11.550
	47	80	2.317	2.406	6.360	11.788
34	35	69	2.370	4.258	5.485	10.448
	36	70	2.410	2.973	5.565	10.369
	37	71	2.482	3.488	5.644	10.570
	38	72	2.584	0.999	5.724	10.145
	39	73	1.736	4.558	5.803	11.409
34	40	74	1.734	3.420	5.883	11.408
	41	75	3.456	0.894	5.962	9.966
	42	76	3.148	1.070	6.042	10.355
	43	77	2.914	3.476	6.121	11.208
	44	78	2.732	2.577	6.201	11.274
34	45	79	2.579	3.710	6.280	11.746
	46	80	2.426	2.032	6.360	11.634
	47	81	2.247	1.939	6.439	11.875
	48	82	2.011	-0.319	6.519	11.594

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
35	40	75	1.660	5.059	5.962	11.818
	41	76	3.382	2.533	6.042	10.572
	42	77	3.074	2.709	6.121	10.947
	43	78	2.840	5.115	6.201	11.690
	44	79	2.659	4.215	6.280	11.792
35	45	80	2.505	5.349	6.360	12.207
	46	81	2.353	3.671	6.439	12.171
	47	82	2.173	3.577	6.519	12.411
	48	83	1.937	1.319	6.598	12.226
	49	84	1.667	-2.975	6.678	11.282
36	37	73	2.322	3.454	5.803	10.948
	38	74	2.424	0.965	5.883	10.519
	39	75	1.577	4.523	5.962	11.796
	40	76	1.574	3.386	6.042	11.796
	41	77	3.296	0.860	6.121	10.332
36	42	78	2.988	1.035	6.201	10.727
	43	79	2.755	3.441	6.280	11.589
	44	80	2.573	2.542	6.360	11.657
	45	81	2.419	3.675	6.439	12.132
	46	82	2.267	1.998	6.519	12.022
36	47	83	2.087	1.904	6.598	12.266
	48	84	1.851	-0.353	6.678	11.984
	49	85	1.581	-4.648	6.757	10.861
	50	86	1.065	-10.084	6.837	9.071
37	43	80	2.635	3.653	6.360	11.850
	44	81	2.453	2.754	6.439	11.926
	45	82	2.299	3.887	6.519	12.393
	46	83	2.147	2.209	6.598	12.297
	47	84	1.967	2.116	6.678	12.542
37	48	85	1.731	-0.142	6.757	12.277
	49	86	1.461	-4.437	6.837	11.176
	50	87	0.945	-9.873	6.916	9.394
	51	88	1.253	-3.323	6.996	12.041

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
38	42	80	2.680	-1.187	6.360	10.559
	43	81	2.447	1.218	6.439	11.565
	44	82	2.265	0.318	6.519	11.592
	45	83	2.111	1.452	6.598	12.141
	46	84	1.959	-0.225	6.678	11.942
38	47	85	1.779	-0.319	6.757	12.190
	48	86	1.543	-2.577	6.837	11.793
	49	87	1.273	-6.872	6.916	10.461
	50	88	0.757	-12.308	6.996	8.482
	51	89	1.065	-5.759	7.075	11.379
38	52	90	1.281	-3.981	7.155	12.039
	53	91	1.427	-1.610	7.234	12.917
39	43	82	1.835	3.129	6.519	12.529
	44	83	1.653	2.230	6.598	12.617
	45	84	1.500	3.364	6.678	13.078
	46	85	1.347	1.686	6.757	13.002
	47	86	1.168	1.592	6.837	13.253
39	48	87	0.932	-0.665	6.916	13.010
	49	88	0.661	-4.960	6.996	11.931
	50	89	0.146	-10.396	7.075	10.144
	51	90	0.454	-3.847	7.155	12.807
	52	91	0.669	-2.069	7.234	13.384
39	53	92	0.816	0.301	7.314	14.113
	54	93	0.914	1.195	7.393	14.418
	55	94	0.980	3.146	7.473	14.931
40	45	85	1.353	0.516	6.757	12.723
	46	86	1.201	-1.160	6.837	12.519
	47	87	1.022	-1.254	6.916	12.773
	48	88	0.785	-3.512	6.996	12.365
	49	89	0.515	-7.807	7.075	10.998
40	50	90	0.000	-13.243	7.155	8.965
	51	91	0.308	-6.694	7.234	11.939
	52	92	0.523	-4.916	7.314	12.617
	53	93	0.670	-2.545	7.393	13.517
	54	94	0.768	-1.651	7.473	13.881

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
40	55	95	0.834	0.299	7.552	14.559
	56	96	0.881	0.430	7.632	14.712
41	47	88	2.803	0.485	6.996	12.076
	48	89	2.567	-1.772	7.075	11.630
	49	90	2.297	-6.067	7.155	10.208
	50	91	1.781	-11.503	7.234	8.133
	51	92	2.090	-4.954	7.314	11.144
41	52	93	2.305	-3.176	7.393	11.829
	53	94	2.451	-0.805	7.473	12.749
	54	95	2.550	0.088	7.552	13.116
	55	96	2.616	2.039	7.632	13.816
	56	97	2.663	2.170	7.711	13.960
41	57	98	2.701	3.685	7.791	14.476
	58	99	2.736	3.168	7.870	14.467
42	47	89	3.588	3.137	7.075	12.395
	48	90	3.352	0.879	7.155	12.038
	49	91	3.082	-3.415	7.234	10.761
	50	92	2.566	-8.851	7.314	8.792
	51	93	2.874	-2.302	7.393	11.665
42	52	94	3.089	-0.524	7.473	12.296
	53	95	3.236	1.846	7.552	13.123
	54	96	3.334	2.740	7.632	13.454
	55	97	3.400	4.691	7.711	14.059
	56	98	3.447	4.822	7.791	14.200
42	57	99	3.485	6.337	7.870	14.635
	58	100	3.521	5.820	7.950	14.658
	59	101	3.303	7.449	8.029	15.229
	60	102	3.336	6.546	8.109	15.217
43	48	91	3.631	2.915	7.234	12.578
	49	92	3.361	-1.380	7.314	11.469
	50	93	2.846	-6.815	7.393	9.633
	51	94	3.154	-0.266	7.473	12.335
	52	95	3.369	1.511	7.552	12.906

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
43	53	96	3.516	3.882	7.632	13.630
	54	97	3.614	4.776	7.711	13.924
	55	98	3.680	6.727	7.791	14.429
	56	99	3.727	6.858	7.870	14.569
	57	100	3.765	8.373	7.950	14.920
43	58	101	3.801	7.855	8.029	14.977
	59	102	3.582	9.484	8.109	15.436
	60	103	3.616	8.582	8.188	15.482
	61	104	3.655	9.097	8.268	15.664
	62	105	3.702	7.732	8.347	15.616
44	48	92	3.698	4.119	7.314	12.990
	49	93	3.428	-0.175	7.393	11.999
	50	94	2.912	-5.611	7.473	10.262
	51	95	3.220	0.937	7.552	12.838
	52	96	3.436	2.715	7.632	13.366
44	53	97	3.582	5.086	7.711	14.019
	54	98	3.680	5.980	7.791	14.288
	55	99	3.747	7.931	7.870	14.724
	56	100	3.794	8.062	7.950	14.862
	57	101	3.832	9.577	8.029	15.157
44	58	102	3.867	9.059	8.109	15.238
	59	103	3.649	10.688	8.188	15.621
	60	104	3.682	9.786	8.268	15.706
	61	105	3.722	10.302	8.347	15.869
	62	106	3.768	8.936	8.427	15.881
44	63	107	3.822	8.998	8.506	16.005
	64	108	3.882	7.244	8.586	15.856
45	52	97	3.427	3.019	7.711	13.601
	53	98	3.574	5.390	7.791	14.238
	54	99	3.672	6.284	7.870	14.500
	55	100	3.738	8.235	7.950	14.919
	56	101	3.785	8.366	8.029	15.056

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
45	57	102	3.823	9.881	8.109	15.336
	58	103	3.859	9.364	8.188	15.423
	59	104	3.641	10.992	8.268	15.787
	60	105	3.674	10.090	8.347	15.882
	61	106	3.713	10.606	8.427	16.040
45	62	107	3.760	9.240	8.506	16.068
	63	108	3.814	9.302	8.586	16.192
	64	109	3.874	7.549	8.665	16.063
	65	110	3.308	10.774	8.745	16.860
	66	111	3.310	10.026	8.824	16.987
46	52	98	3.373	2.458	7.791	13.617
	53	99	3.519	4.829	7.870	14.294
	54	100	3.617	5.723	7.950	14.570
	55	101	3.684	7.674	8.029	15.024
	56	102	3.731	7.805	8.109	15.162
46	57	103	3.769	9.320	8.188	15.470
	58	104	3.804	8.803	8.268	15.545
	59	105	3.586	10.431	8.347	15.946
	60	106	3.619	9.529	8.427	16.024
	61	107	3.659	10.045	8.506	16.190
46	62	108	3.705	8.679	8.586	16.190
	63	109	3.759	8.741	8.665	16.314
	64	110	3.819	6.988	8.745	16.146
	65	111	3.254	10.213	8.824	17.025
	66	112	3.255	9.465	8.904	17.138
46	67	113	3.453	9.761	8.983	17.198
	68	114	3.439	9.091	9.063	17.304
47	56	103	3.575	6.492	8.188	15.194
	57	104	3.613	8.007	8.268	15.563
	58	105	3.648	7.490	8.347	15.614
	59	106	3.430	9.118	8.427	16.097
	60	107	3.463	8.216	8.506	16.134

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
47	61	108	3.503	8.732	8.586	16.320
	62	109	3.549	7.366	8.665	16.256
	63	110	3.603	7.428	8.745	16.378
	64	111	3.663	5.675	8.824	16.125
	65	112	3.098	8.900	8.904	17.188
47	66	113	3.099	8.152	8.983	17.267
	67	114	3.297	8.448	9.063	17.326
	68	115	3.283	7.778	9.142	17.402
	69	116	3.280	8.019	9.222	17.589
	70	117	3.284	6.681	9.301	17.521
48	53	101	2.978	1.633	8.029	14.103
	54	102	3.076	2.527	8.109	14.445
	55	103	3.142	4.478	8.188	15.073
	56	104	3.189	4.609	8.268	15.215
	57	105	3.227	6.124	8.347	15.663
48	58	106	3.263	5.606	8.427	15.682
	59	107	3.044	7.235	8.506	16.271
	60	108	3.078	6.333	8.586	16.255
	61	109	3.117	6.849	8.665	16.467
	62	110	3.164	5.483	8.745	16.322
48	63	111	3.217	5.545	8.824	16.443
	64	112	3.277	3.791	8.904	16.083
	65	113	2.712	7.017	8.983	17.377
	66	114	2.713	6.269	9.063	17.412
	67	115	2.911	6.565	9.142	17.473
48	68	116	2.898	5.895	9.222	17.510
	69	117	2.894	6.136	9.301	17.711
	70	118	2.898	4.798	9.381	17.561
	71	119	4.099	2.818	9.460	15.943
49	59	108	2.231	5.029	8.586	16.615
	60	109	2.265	4.126	8.665	16.555
	61	110	2.304	4.642	8.745	16.791
	62	111	2.351	3.276	8.824	16.577
	63	112	2.404	3.339	8.904	16.698

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
49	64	113	2.464	1.585	8.983	16.248
	65	114	1.899	4.810	9.063	17.744
	66	115	1.900	4.062	9.142	17.744
	67	116	2.098	4.358	9.222	17.807
	68	117	2.085	3.688	9.301	17.811
49	69	118	2.081	3.929	9.381	18.027
	70	119	2.085	2.591	9.460	17.807
	71	120	3.287	0.611	9.540	16.003
	72	121	3.094	0.681	9.619	16.377
	73	122	2.937	2.345	9.699	17.350
50	57	107	0.919	1.686	8.506	16.713
	58	108	0.955	1.169	8.586	16.703
	59	109	0.736	2.798	8.665	17.424
	60	110	0.770	1.896	8.745	17.355
	61	111	0.809	2.411	8.824	17.604
50	62	112	0.856	1.046	8.904	17.371
	63	113	0.909	1.108	8.983	17.498
	64	114	0.969	-0.645	9.063	17.019
	65	115	0.404	2.580	9.142	18.596
	66	116	0.405	1.831	9.222	18.589
50	67	117	0.603	2.127	9.301	18.657
	68	118	0.590	1.457	9.381	18.656
	69	119	0.586	1.699	9.460	18.882
	70	120	0.590	0.361	9.540	18.643
	71	121	1.791	-1.618	9.619	16.769
50	72	122	1.599	-1.548	9.699	17.155
	73	123	1.441	0.115	9.778	18.171
	74	124	1.311	-0.454	9.858	18.228
	75	125	1.199	0.448	9.937	18.843
51	65	116	0.596	3.919	9.222	18.860
	66	117	0.597	3.170	9.301	18.889
	67	118	0.795	3.467	9.381	18.955
	68	119	0.782	2.797	9.460	18.986
	69	120	0.778	3.038	9.540	19.202

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
51	70	121	0.782	1.700	9.619	19.027
	71	122	1.983	-0.279	9.699	17.295
	72	123	1.791	-0.209	9.778	17.674
	73	124	1.634	1.454	9.858	18.615
	74	125	1.503	0.884	9.937	18.694
51	75	126	1.391	1.787	10.017	19.264
	76	127	1.287	0.693	10.096	19.144
	77	128	1.181	0.847	10.176	19.460
52	63	115	1.501	3.215	9.142	17.869
	64	116	1.572	1.450	9.222	17.470
	65	117	0.890	4.792	9.301	18.945
	66	118	0.891	4.044	9.381	18.988
	67	119	1.129	4.300	9.460	19.016
52	68	120	1.112	3.634	9.540	19.060
	69	121	1.107	3.877	9.619	19.272
	70	122	1.111	2.538	9.699	19.120
	71	123	2.553	0.318	9.778	17.079
	72	124	2.320	0.428	9.858	17.517
52	73	125	2.130	2.124	9.937	18.506
	74	126	1.973	1.582	10.017	18.620
	75	127	1.838	2.508	10.096	19.216
	76	128	1.712	1.435	10.176	19.129
	77	129	1.584	1.611	10.255	19.471
52	78	130	1.439	0.117	10.335	19.208
	79	131	1.264	-0.433	10.414	19.319
53	69	122	1.251	5.349	9.699	19.574
	70	123	1.255	4.011	9.778	19.499
	71	124	2.707	1.780	9.858	17.655
	72	125	2.473	1.892	9.937	18.081
	73	126	2.281	3.590	10.017	18.975
53	74	127	2.123	3.049	10.096	19.112
	75	128	1.987	3.976	10.176	19.651
	76	129	1.860	2.904	10.255	19.620
	77	130	1.731	3.081	10.335	19.948
	78	131	1.585	1.588	10.414	19.764

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
53	79	132	1.408	1.038	10.494	19.900
	80	133	1.185	-0.764	10.573	19.559
	81	134	0.900	-2.011	10.653	19.460
54	66	120	1.159	5.347	9.540	19.317
	67	121	1.400	5.600	9.619	19.342
	68	122	1.383	4.934	9.699	19.413
	69	123	1.377	5.177	9.778	19.615
	70	124	1.381	3.839	9.858	19.517
54	71	125	2.844	1.598	9.937	17.581
	72	126	2.608	1.712	10.017	18.016
	73	127	2.415	3.411	10.096	18.946
	74	128	2.256	2.871	10.176	19.078
	75	129	2.118	3.799	10.255	19.638
54	76	130	1.991	2.728	10.335	19.591
	77	131	1.860	2.906	10.414	19.925
	78	132	1.713	1.414	10.494	19.719
	79	133	1.535	0.866	10.573	19.849
	80	134	1.310	-0.935	10.653	19.484
54	81	135	1.023	-2.180	10.732	19.372
	82	136	0.658	-12.098	10.812	13.426
	83	137	1.288	-4.086	10.891	18.254
55	73	128	2.544	4.129	10.176	19.187
	74	129	2.384	3.590	10.255	19.330
	75	130	2.245	4.520	10.335	19.866
	76	131	2.116	3.450	10.414	19.844
	77	132	1.985	3.629	10.494	20.172
55	78	133	1.836	2.138	10.573	20.000
	79	134	1.657	1.591	10.653	20.143
	80	135	1.430	-0.208	10.732	19.817
	81	136	1.141	-1.450	10.812	19.732
	82	137	0.773	-11.366	10.891	13.917
55	83	138	1.407	-3.358	10.971	18.657
	84	139	1.901	-2.198	11.050	18.803

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
56	70	126	1.630	3.408	10.017	19.513
	71	127	3.115	1.144	10.096	17.374
	72	128	2.875	1.262	10.176	17.829
	73	129	2.679	2.964	10.255	18.838
	74	130	2.517	2.427	10.335	18.958
56	75	131	2.377	3.357	10.414	19.564
	76	132	2.247	2.289	10.494	19.481
	77	133	2.114	2.469	10.573	19.830
	78	134	1.965	0.979	10.653	19.572
	79	135	1.784	0.434	10.732	19.692
56	80	136	1.555	-1.363	10.812	19.271
	81	137	1.264	-2.604	10.891	19.131
	82	138	0.893	-12.516	10.971	12.923
	83	139	1.532	-4.513	11.050	17.916
	84	140	2.029	-3.357	11.130	18.077
56	85	141	2.411	-1.798	11.209	18.620
	86	142	2.702	-0.997	11.289	18.822
57	76	133	2.607	3.813	10.573	19.780
	77	134	2.473	3.995	10.653	20.115
	78	135	2.322	2.507	10.732	19.924
	79	136	2.139	1.963	10.812	20.064
	80	137	1.909	0.167	10.891	19.719
57	81	138	1.615	-1.070	10.971	19.627
	82	139	1.241	-10.979	11.050	13.690
	83	140	1.885	-2.981	11.130	18.504
	84	141	2.386	-1.828	11.209	18.637
	85	142	2.771	-0.272	11.289	19.132
57	86	143	3.063	0.525	11.368	19.313
	87	144	3.286	1.949	11.448	19.879
	88	145	3.456	2.377	11.527	20.009
58	74	132	2.888	4.200	10.494	19.477
	75	133	2.746	5.134	10.573	20.026
	76	134	2.614	4.067	10.653	20.001
	77	135	2.479	4.249	10.732	20.335
	78	136	2.327	2.763	10.812	20.159

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
58	79	137	2.142	2.221	10.891	20.306
	80	138	1.910	0.427	10.971	19.980
	81	139	1.613	-0.808	11.050	19.901
	82	140	1.237	-10.714	11.130	14.005
	83	141	1.886	-2.722	11.209	18.790
58	84	142	2.390	-1.573	11.289	18.911
	85	143	2.778	-0.020	11.368	19.393
	86	144	3.073	0.776	11.448	19.566
	87	145	3.297	2.198	11.527	20.120
	88	146	3.469	2.624	11.607	20.246
58	89	147	3.604	3.848	11.686	20.757
	90	148	3.715	3.902	11.766	20.790
59	78	137	2.340	4.622	10.891	20.873
	79	138	2.155	4.081	10.971	21.054
	80	139	1.920	2.289	11.050	20.867
	81	140	1.621	1.055	11.130	20.873
	82	141	1.242	-8.847	11.209	15.550
59	83	142	1.896	-0.859	11.289	19.948
	84	143	2.405	0.285	11.368	20.026
	85	144	2.795	1.835	11.448	20.421
	86	145	3.093	2.629	11.527	20.559
	87	146	3.319	4.049	11.607	21.017
59	88	147	3.491	4.474	11.686	21.128
	89	148	3.627	5.697	11.766	21.545
	90	149	3.739	5.750	11.845	21.589
60	78	138	2.372	3.931	10.971	20.797
	79	139	2.184	3.392	11.050	20.968
	80	140	1.948	1.602	11.130	20.725
	81	141	1.646	0.371	11.209	20.702
	82	142	1.263	-9.528	11.289	15.100
60	83	143	1.923	-1.546	11.368	19.684
	84	144	2.436	-0.405	11.448	19.768
	85	145	2.830	1.141	11.527	20.194
	86	146	3.130	1.932	11.607	20.340
	87	147	3.357	3.351	11.686	20.838

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
60	88	148	3.531	3.775	11.766	20.952
	89	149	3.668	4.997	11.845	21.409
	90	150	3.781	5.048	11.925	21.445
	91	151	3.982	5.750	12.004	21.615
	92	152	4.082	5.341	12.084	21.499
61	80	141	1.998	2.692	11.209	21.229
	81	142	1.694	1.464	11.289	21.254
	82	143	1.307	-8.432	11.368	15.986
	83	144	1.972	-0.455	11.448	20.339
	84	145	2.490	0.681	11.527	20.395
61	85	146	2.887	2.224	11.607	20.769
	86	147	3.189	3.014	11.686	20.894
	87	148	3.418	4.430	11.766	21.336
	88	149	3.594	4.853	11.845	21.440
	89	150	3.732	6.074	11.925	21.844
61	90	151	3.846	6.124	12.004	21.886
	91	152	4.048	6.825	12.084	22.032
	92	153	4.149	6.415	12.163	21.943
	93	154	4.252	7.188	12.243	22.216
	94	155	4.364	6.432	12.322	21.999
62	78	140	2.504	3.517	11.130	20.829
	79	141	2.313	2.982	11.209	20.994
	80	142	2.073	1.196	11.289	20.708
	81	143	1.766	-0.029	11.368	20.665
	82	144	1.376	-9.922	11.448	14.819
62	83	145	2.047	-1.951	11.527	19.560
	84	146	2.568	-0.819	11.607	19.637
	85	147	2.969	0.720	11.686	20.080
	86	148	3.274	1.507	11.766	20.227
	87	149	3.505	2.922	11.845	20.755
62	88	150	3.682	3.343	11.925	20.868
	89	151	3.821	4.563	12.004	21.358
	90	152	3.935	4.613	12.084	21.385
	91	153	4.140	5.312	12.163	21.563
	92	154	4.241	4.901	12.243	21.420

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
62	93	155	4.345	5.673	12.322	21.745
	94	156	4.458	4.917	12.402	21.441
	95	157	4.584	5.412	12.481	21.636
	96	158	4.726	4.337	12.561	21.106
63	84	147	2.674	-0.492	11.686	19.813
	85	148	3.078	1.044	11.766	20.243
	86	149	3.385	1.828	11.845	20.382
	87	150	3.618	3.241	11.925	20.899
	88	151	3.797	3.661	12.004	21.008
63	89	152	3.937	4.879	12.084	21.489
	90	153	4.052	4.928	12.163	21.515
	91	154	4.258	5.626	12.243	21.687
	92	155	4.360	5.214	12.322	21.546
	93	156	4.465	5.985	12.402	21.865
63	94	157	4.579	5.228	12.481	21.564
	95	158	4.706	5.723	12.561	21.755
	96	159	4.849	4.646	12.640	21.229
	97	160	5.010	4.852	12.720	21.251
	98	161	5.192	3.485	12.799	20.412
64	84	148	2.807	-2.682	11.766	18.413
	85	149	3.214	-1.148	11.845	18.934
	86	150	3.524	-0.366	11.925	19.102
	87	151	3.759	1.043	12.004	19.734
	88	152	3.939	1.462	12.084	19.855
64	89	153	4.080	2.679	12.163	20.452
	90	154	4.197	2.728	12.243	20.457
	91	155	4.404	3.423	12.322	20.673
	92	156	4.507	3.011	12.402	20.454
	93	157	4.612	3.781	12.481	20.846
64	94	158	4.727	3.024	12.561	20.420
	95	159	4.855	3.517	12.640	20.644
	96	160	4.999	2.439	12.720	19.949
	97	161	5.162	2.643	12.799	19.959
	98	162	5.345	1.275	12.879	18.916

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
64	99	163	5.547	1.183	12.958	18.650
	100	164	5.768	-0.444	13.038	17.186
65	89	154	5.038	2.537	12.243	19.203
	90	155	5.155	2.585	12.322	19.191
	91	156	5.363	3.280	12.402	19.425
	92	157	5.466	2.867	12.481	19.161
	93	158	5.572	3.638	12.561	19.586
65	94	159	5.687	2.879	12.640	19.090
	95	160	5.815	3.373	12.720	19.326
	96	161	5.960	2.294	12.799	18.537
	97	162	6.124	2.498	12.879	18.536
	98	163	6.307	1.128	12.958	17.385
65	99	164	6.511	1.035	13.038	17.085
	100	165	6.733	-0.593	13.117	15.509
	101	166	5.908	3.112	13.197	19.741
66	86	152	4.276	-0.425	12.084	18.218
	87	153	4.515	0.981	12.163	18.889
	88	154	4.697	1.397	12.243	19.006
	89	155	4.840	2.612	12.322	19.648
	90	156	4.958	2.659	12.402	19.636
66	91	157	5.169	3.351	12.481	19.862
	92	158	5.272	2.938	12.561	19.603
	93	159	5.379	3.707	12.640	20.021
	94	160	5.495	2.948	12.720	19.534
	95	161	5.625	3.440	12.799	19.765
66	96	162	5.771	2.360	12.879	18.987
	97	163	5.936	2.562	12.958	18.984
	98	164	6.122	1.191	13.038	17.842
	99	165	6.327	1.096	13.117	17.541
	100	166	6.552	-0.535	13.197	15.970
66	101	167	5.719	3.178	13.276	20.193
	102	168	5.687	2.879	13.356	20.170
	103	169	5.695	3.236	13.435	20.510

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
67	93	160	5.240	6.137	12.720	21.548
	94	161	5.357	5.376	12.799	21.184
	95	162	5.488	5.867	12.879	21.379
	96	163	5.636	4.786	12.958	20.766
	97	164	5.802	4.986	13.038	20.769
67	98	165	5.989	3.613	13.117	19.819
	99	166	6.196	3.517	13.197	19.562
	100	167	6.423	1.883	13.276	18.184
	101	168	5.583	5.604	13.356	21.911
	102	169	5.550	5.305	13.435	21.932
67	103	170	5.558	5.662	13.515	22.236
	104	171	5.605	4.830	13.594	21.854
	105	172	6.355	3.113	13.674	19.738
68	91	159	4.936	5.077	12.640	21.321
	92	160	5.041	4.661	12.720	21.117
	93	161	5.150	5.429	12.799	21.477
	94	162	5.269	4.667	12.879	21.077
	95	163	5.401	5.157	12.958	21.280
68	96	164	5.550	4.074	13.038	20.618
	97	165	5.718	4.273	13.117	20.615
	98	166	5.907	2.898	13.197	19.604
	99	167	6.116	2.799	13.276	19.328
	100	168	6.345	1.164	13.356	17.882
68	101	169	5.497	4.893	13.435	21.787
	102	170	5.464	4.594	13.515	21.799
	103	171	5.472	4.951	13.594	22.113
	104	172	5.519	4.119	13.674	21.696
	105	173	6.276	2.395	13.753	19.468
68	106	174	5.950	2.777	13.833	20.394
	107	175	5.686	4.576	13.912	22.096
69	95	164	5.358	6.819	13.038	22.230
	96	165	5.509	5.735	13.117	21.684
	97	166	5.678	5.932	13.197	21.684
	98	167	5.869	4.555	13.276	20.810
	99	168	6.080	4.455	13.356	20.564

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
69	100	169	6.311	2.817	13.435	19.260
	101	170	5.455	6.554	13.515	22.802
	102	171	5.421	6.256	13.594	22.844
	103	172	5.429	6.613	13.674	23.131
	104	173	5.477	5.780	13.753	22.801
69	105	174	6.241	4.049	13.833	20.788
	106	175	5.913	4.435	13.912	21.666
	107	176	5.645	6.236	13.992	23.192
	108	177	5.435	6.069	14.071	23.534
	109	178	5.276	7.333	14.151	24.456
70	93	163	5.099	5.739	12.958	21.953
	94	164	5.220	4.975	13.038	21.563
	95	165	5.354	5.462	13.117	21.756
	96	166	5.506	4.377	13.197	21.105
	97	167	5.678	4.572	13.276	21.096
70	98	168	5.870	3.194	13.356	20.093
	99	169	6.083	3.091	13.435	19.810
	100	170	6.316	1.451	13.515	18.365
	101	171	5.451	5.197	13.594	22.274
	102	172	5.417	4.899	13.674	22.292
70	103	173	5.426	5.256	13.753	22.603
	104	174	5.474	4.423	13.833	22.197
	105	175	6.245	2.684	13.912	19.957
	106	176	5.913	3.073	13.992	20.896
	107	177	5.643	4.877	14.071	22.591
70	108	178	5.431	4.713	14.151	22.942
	109	179	5.270	5.978	14.230	23.987
	110	180	5.155	5.330	14.310	23.952
	111	181	5.079	6.075	14.389	24.570
71	99	170	6.117	3.991	13.515	20.464
	100	171	6.353	2.349	13.594	19.083
	101	172	5.479	6.104	13.674	22.826
	102	173	5.445	5.806	13.753	22.859
	103	174	5.453	6.163	13.833	23.157

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
71	104	175	5.502	5.330	13.912	22.794
	105	176	6.281	3.583	13.992	20.650
	106	177	5.945	3.976	14.071	21.570
	107	178	5.673	5.783	14.151	23.181
	108	179	5.458	5.620	14.230	23.536
71	109	180	5.296	6.888	14.310	24.514
	110	181	5.179	6.240	14.389	24.510
72	99	171	6.175	2.096	13.594	19.192
	100	172	6.413	0.451	13.674	17.619
	101	173	5.530	4.215	13.753	21.863
	102	174	5.495	3.918	13.833	21.862
	103	175	5.504	4.275	13.912	22.192
72	104	176	5.553	3.441	13.992	21.722
	105	177	6.339	1.687	14.071	19.266
	106	178	6.000	2.083	14.151	20.268
	107	179	5.725	3.893	14.230	22.112
	108	180	5.508	3.732	14.310	22.478
72	109	181	5.344	5.002	14.389	23.627
	110	182	5.226	4.355	14.469	23.561
	111	183	5.149	5.102	14.548	24.238
	112	184	5.103	4.036	14.628	23.818
	113	185	5.082	4.280	14.707	24.130
73	104	177	5.617	3.606	14.071	21.851
	105	178	6.411	1.844	14.151	19.372
	106	179	6.069	2.243	14.230	20.386
	107	180	5.790	4.056	14.310	22.237
	108	181	5.571	3.898	14.389	22.609
73	109	182	5.405	5.169	14.469	23.760
	110	183	5.286	4.524	14.548	23.698
	111	184	5.208	5.272	14.628	24.376
	112	185	5.161	4.206	14.707	23.960
	113	186	5.140	4.451	14.787	24.272

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
74	102	176	5.624	1.768	13.992	20.443
	103	177	5.632	2.125	14.071	20.808
	104	178	5.682	1.290	14.151	20.214
	105	179	6.485	-0.479	14.230	17.395
	106	180	6.138	-0.076	14.310	18.493
74	107	181	5.857	1.739	14.389	20.596
	108	182	5.635	1.583	14.469	20.980
	109	183	5.467	2.856	14.548	22.325
	110	184	5.347	2.213	14.628	22.189
	111	185	5.268	2.961	14.707	22.978
74	112	186	5.221	1.896	14.787	22.415
	113	187	5.199	2.141	14.866	22.756
	114	188	5.192	0.719	14.946	21.782
	115	189	5.192	0.485	15.025	21.708
	116	190	5.185	-1.230	15.105	20.337
74	117	191	5.161	-1.909	15.184	19.862
	118	192	5.106	-3.853	15.264	18.174
75	105	180	6.546	-1.044	14.310	16.868
	106	181	6.195	-0.636	14.389	17.997
	107	182	5.911	1.181	14.469	20.173
	108	183	5.686	1.029	14.548	20.565
	109	184	5.517	2.303	14.628	21.964
75	110	185	5.395	1.661	14.707	21.812
	111	186	5.314	2.411	14.787	22.632
	112	187	5.267	1.346	14.866	22.031
	113	188	5.245	1.592	14.946	22.381
	114	189	5.238	0.169	15.025	21.356
75	115	190	5.237	-0.063	15.105	21.271
	116	191	5.230	-1.779	15.184	19.845
	117	192	5.206	-2.458	15.264	19.350

3. LEVEL DENSITY PARAMETERS FOR FISSION FRAGMENTS ($25 \leq Z \leq 70$)

3.1. FOREWORD :

This Section contains values of a-parameters of nuclei with neutron excess in the mass range $57 \leq A \leq 191$, available to us as fragment nucleides from prompt fission. Nilsson level sequence[1] has been assumed to be valid for these species away from the valley of beta-stability. The main use of the predictions in Table 2 (pp. 3.2 - 3.13) will be in the calculations of prompt fragment mass and charge yields and distributions. In addition, use of the knowledge of deformation energies may be necessary to understand the fission energy kinetics and kinematics. As an example, we cite the work of our group[2] to evaluate the prompt gamma-ray yields from fission fragments.

Some limited excercise of computing the prompt mass yields from ^{239}U (using ^{238}U target and 1 MeV and 14 MeV neutrons) was done[3] using the Fong-Ericson type of formulation[4]; fairly good fit was obtained. Calculations are currently under way to perfect a method to predict $\bar{\nu}$ and fragment mass distributions[5].

3.2. REFERENCES :

1. See ref.[15] in Sec. 1.7 .
2. R. Sarkar and A. Chatterjee, Phys. Lett. 33B(1971)203 .
3. R. Sarkar, Ph.D. Dissertation, 1971 (unpublished)
4. P. Fong, Phys. Rev. 102(1956)434; 122(1961)1453; 135B(1964)1338; T. Ericson, Advances in Phys. (Phil. Mag. Suppl.) 9(1960)425 .
5. H. Majumdar .

3.3. THE TABLE (TABLE 2)

See comments and explanation of the symbols of column headings in Sec. 1.6 .

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
25	32	57	3.799	5.040	4.536	7.803
	33	58	4.190	7.040	4.616	7.886
	34	59	4.190	7.320	4.696	8.043
	35	60	4.199	9.180	4.775	8.300
	36	61	4.240	7.890	4.855	8.328
26	35	61	3.969	6.710	4.855	8.398
	36	62	4.010	5.420	4.934	8.399
	37	63	4.080	5.940	5.014	8.540
	38	64	4.180	3.450	5.093	8.365
	39	65	3.340	7.009	5.173	9.363
27	38	65	3.350	0.260	5.173	8.586
	39	66	2.510	3.820	5.253	9.681
	40	67	2.500	2.680	5.332	9.690
	41	68	4.230	0.150	5.412	8.429
	42	69	3.920	0.330	5.491	8.773
28	41	69	2.230	-3.050	5.491	9.200
	42	70	1.920	-2.870	5.571	9.543
	43	71	1.680	-0.470	5.651	10.268
	44	72	1.500	-1.370	5.730	10.352
	45	73	1.350	-0.230	5.810	10.798
29	41	70	2.559	0.760	5.571	9.807
	42	71	2.250	0.940	5.651	10.164
	43	72	2.010	3.340	5.730	10.812
	44	73	1.830	2.440	5.810	10.946
	45	74	1.679	3.580	5.889	11.356
29	46	75	1.529	1.900	5.969	11.351
	47	76	1.350	1.810	6.049	11.602
30	42	72	2.470	0.960	5.730	10.175
	43	73	2.230	3.360	5.810	10.826
	44	74	2.050	2.460	5.889	10.960
	45	75	1.900	3.600	5.969	11.371
	46	76	1.750	1.920	6.049	11.365
30	47	77	1.570	1.830	6.128	11.617
	48	78	1.330	-0.369	6.208	11.523

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
31	43	74	2.390	4.330	5.889	10.999
	44	75	2.210	3.429	5.969	11.145
	45	76	2.060	4.570	6.049	11.549
	46	77	1.910	2.890	6.128	11.563
	47	78	1.730	2.800	6.208	11.819
31	48	79	1.490	0.600	6.287	11.753
	49	80	1.160	-0.660	6.367	11.869
32	47	79	1.860	1.030	6.287	11.587
	48	80	1.620	-1.170	6.367	11.467
	49	81	1.290	-2.430	6.447	11.548
	50	82	0.840	-4.700	6.526	11.410
	51	83	1.151	-4.750	6.606	11.342
32	52	84	1.363	-2.622	6.685	11.881
	53	85	1.508	-0.262	6.765	12.456
33	48	81	2.070	0.200	6.447	11.583
	49	82	1.739	-1.060	6.526	11.697
	50	83	1.290	-3.330	6.606	11.617
	51	84	1.601	-3.380	6.685	11.541
	52	85	1.812	-1.252	6.765	12.032
33	53	86	1.958	1.108	6.845	12.558
	54	87	2.057	2.014	6.924	12.800
34	49	83	1.670	-1.520	6.606	11.787
	50	84	1.220	-3.790	6.685	11.686
	51	85	1.531	-3.840	6.765	11.609
	52	86	1.743	-1.712	6.845	12.119
	53	87	1.888	0.648	6.924	12.664
34	54	88	1.987	1.554	7.004	12.914
	55	89	2.051	3.496	7.083	13.360
35	50	85	1.150	-2.160	6.765	12.276
	51	86	1.461	-2.210	6.845	12.197
	52	87	1.672	-0.081	6.924	12.670
	53	88	1.817	2.278	7.004	13.175
	54	89	1.917	3.184	7.083	13.410

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
35	55	90	1.980	5.126	7.163	13.823
	56	91	2.028	5.267	7.243	13.960
36	51	87	1.371	-3.870	6.924	11.982
	52	88	1.583	-1.742	7.004	12.507
	53	89	1.728	0.618	7.083	13.068
	54	90	1.827	1.524	7.163	13.324
	55	91	1.890	3.466	7.243	13.781
36	56	92	1.938	3.607	7.322	13.919
	57	93	1.976	5.115	7.402	14.285
37	52	89	1.463	-1.542	7.083	12.783
	53	90	1.608	0.817	7.163	13.347
	54	91	1.707	1.724	7.243	13.603
	55	92	1.771	3.666	7.322	14.062
	56	93	1.817	3.807	7.402	14.202
37	57	94	1.857	5.315	7.481	14.568
	58	95	1.895	4.797	7.561	14.610
	59	96	1.677	6.418	7.640	15.192
38	54	92	1.517	-0.695	7.322	13.376
	55	93	1.581	1.246	7.402	13.903
	56	94	1.628	1.387	7.481	14.045
	57	95	1.667	2.895	7.561	14.464
	58	96	1.705	2.377	7.640	14.485
38	59	97	1.487	3.998	7.720	15.121
	60	98	1.519	3.105	7.800	15.084
	61	99	1.560	3.618	7.879	15.302
39	56	95	1.018	3.297	7.561	15.057
	57	96	1.057	4.805	7.640	15.452
	58	97	1.095	4.287	7.720	15.493
	59	98	0.876	5.908	7.800	16.100
	60	99	0.908	5.015	7.879	16.093
39	61	100	0.949	5.528	7.959	16.307
	62	101	0.995	4.169	8.038	16.195
	63	102	1.049	4.221	8.118	16.319

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
40	57	97	0.917	1.954	7.720	15.185
	58	98	0.955	1.437	7.800	15.198
	59	99	0.737	3.058	7.879	15.873
	60	100	0.769	2.165	7.959	15.821
	61	101	0.810	2.678	8.038	16.055
40	62	102	0.855	1.318	8.118	15.874
	63	103	0.909	1.371	8.198	15.997
	64	104	0.969	-0.383	8.277	15.662
	65	105	0.402	2.842	8.357	17.074
41	59	100	2.517	4.798	7.959	14.830
	60	101	2.549	3.905	8.038	14.795
	61	102	2.590	4.418	8.118	14.995
	62	103	2.635	3.059	8.198	14.849
	63	104	2.689	3.111	8.277	14.954
41	64	105	2.749	1.356	8.357	14.674
	65	106	2.182	4.582	8.436	15.997
	66	107	2.182	3.839	8.516	16.008
	67	108	2.381	4.133	8.596	16.025
42	61	103	3.369	7.067	8.198	14.817
	62	104	3.414	5.708	8.277	14.719
	63	105	3.469	5.760	8.357	14.816
	64	106	3.528	4.006	8.436	14.603
	65	107	2.961	7.232	8.516	15.822
42	66	108	2.961	6.489	8.596	15.861
	67	109	3.161	6.782	8.675	15.851
	68	110	3.145	6.119	8.755	15.910
	69	111	3.145	6.353	8.834	16.091
43	63	106	3.749	7.781	8.436	14.962
	64	107	3.809	6.026	8.516	14.796
	65	108	3.242	9.252	8.596	15.942
	66	109	3.242	8.509	8.675	16.002
	67	110	3.441	8.803	8.755	15.979
43	68	111	3.426	8.140	8.834	16.057
	69	112	3.426	8.373	8.914	16.231
	70	113	3.426	7.048	8.994	16.193
	71	114	4.626	5.062	9.073	14.705

Z	N	MASS	DEF-F	DELTA E	A-ZERO	A-PAR
44	65	109	3.311	10.462	8.675	16.143
	66	110	3.311	9.719	8.755	16.216
	67	111	3.510	10.013	8.834	16.185
	68	112	3.495	9.350	8.914	16.275
	69	113	3.495	9.583	8.994	16.446
44	70	114	3.495	8.258	9.073	16.431
	71	115	4.696	6.271	9.153	14.951
	72	116	4.510	6.337	9.232	15.304
	73	117	4.348	7.998	9.312	15.864
45	67	112	3.501	10.313	8.914	16.372
	68	113	3.486	9.649	8.994	16.465
	69	114	3.486	9.883	9.073	16.636
	70	115	3.486	8.558	9.153	16.625
	71	116	4.686	6.572	9.232	15.139
45	72	117	4.500	6.637	9.312	15.494
	73	118	4.339	8.299	9.392	16.051
	74	119	4.212	7.733	9.471	16.258
	75	120	4.093	8.637	9.551	16.657
46	69	115	3.436	9.323	9.153	16.773
	70	116	3.436	7.998	9.232	16.749
	71	117	4.635	6.012	9.312	15.240
	72	118	4.450	6.077	9.392	15.596
	73	119	4.289	7.739	9.471	16.169
46	74	120	4.162	7.173	9.551	16.370
	75	121	4.043	8.077	9.630	16.779
	76	122	3.942	6.985	9.710	16.873
	77	123	3.832	7.144	9.789	17.167
47	71	118	4.475	4.702	9.392	15.329
	72	119	4.290	4.767	9.471	15.685
	73	120	4.129	6.429	9.551	16.292
	74	121	4.002	5.863	9.630	16.480
	75	122	3.883	6.767	9.710	16.908
47	76	123	3.781	5.675	9.789	16.977
	77	124	3.672	5.834	9.869	17.273
	78	125	3.553	4.321	9.949	17.258
	79	126	3.408	3.729	10.028	17.437

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
48	72	120	3.900	2.897	9.551	15.884
	73	121	3.739	4.559	9.630	16.542
	74	122	3.611	3.993	9.710	16.710
	75	123	3.493	4.897	9.789	17.165
	76	124	3.391	3.805	9.869	17.196
48	77	125	3.281	3.964	9.949	17.496
	78	126	3.163	2.451	10.028	17.424
	79	127	3.018	1.859	10.108	17.578
	80	128	2.833	0.028	10.187	17.420
	81	129	2.595	-1.274	10.267	17.416
49	74	123	2.802	1.783	9.789	17.241
	75	124	2.683	2.687	9.869	17.736
	76	125	2.582	1.595	9.949	17.714
	77	126	2.472	1.754	10.028	18.018
	78	127	2.353	0.240	10.108	17.869
49	79	128	2.209	-0.351	10.187	17.987
	80	129	2.023	-2.182	10.267	17.723
	81	130	1.785	-3.484	10.347	17.633
	82	131	1.490	-13.469	10.426	13.230
	83	132	2.010	-5.355	10.506	16.925
50	76	126	1.092	-0.635	10.028	18.771
	77	127	0.982	-0.476	10.108	19.083
	78	128	0.863	-1.989	10.187	18.835
	79	129	0.719	-2.581	10.267	18.907
	80	130	0.533	-4.412	10.347	18.505
50	81	131	0.296	-5.715	10.426	18.301
	82	132	0.000	-15.700	10.506	12.996
	83	133	0.520	-7.585	10.585	17.475
	84	134	0.926	-5.405	10.665	18.250
	85	135	1.240	-4.711	10.745	18.375
51	78	129	1.053	-0.649	10.267	19.253
	79	130	0.908	-1.241	10.347	19.349
	80	131	0.723	-3.072	10.426	19.006
	81	132	0.486	-4.375	10.506	18.851
	82	133	0.190	-14.360	10.585	13.859

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
51	83	134	0.710	-6.245	10.665	18.076
	84	135	1.116	-4.065	10.745	18.775
	85	136	1.429	-3.371	10.824	18.871
	86	137	1.660	-2.478	10.904	19.112
	87	138	1.860	-1.059	10.983	19.550
52	80	132	1.031	-2.220	10.506	19.165
	81	133	0.747	-3.476	10.585	19.109
	82	134	0.393	-13.403	10.665	14.426
	83	135	1.014	-5.389	10.745	18.306
	84	136	1.497	-3.286	10.824	18.833
52	85	137	1.871	-2.652	10.904	18.814
	86	138	2.144	-1.802	10.983	18.962
	87	139	2.381	-0.420	11.063	19.307
	88	140	2.535	0.022	11.143	19.410
	89	141	2.664	1.250	11.222	19.776
53	82	135	0.528	-11.928	10.745	15.335
	83	136	1.153	-3.918	10.824	18.937
	84	137	1.640	-1.819	10.904	19.380
	85	138	2.016	-1.187	10.983	19.327
	86	139	2.291	-0.339	11.063	19.440
53	87	140	2.530	1.040	11.143	19.737
	88	141	2.684	1.483	11.222	19.822
	89	142	2.815	2.709	11.302	20.150
	90	143	2.921	2.767	11.381	20.171
	91	144	3.111	3.478	11.461	20.255
54	84	138	1.773	-1.992	10.983	19.310
	85	139	2.151	-1.362	11.063	19.250
	86	140	2.428	-0.516	11.143	19.358
	87	141	2.669	0.861	11.222	19.653
	88	142	2.824	1.303	11.302	19.735
54	89	143	2.955	2.529	11.381	20.062
	90	144	3.063	2.585	11.461	20.080
	91	145	3.254	3.295	11.541	20.160
	92	146	3.349	2.893	11.620	20.066
	93	147	3.444	3.674	11.700	20.282

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
55	85	140	2.277	-0.648	11.143	19.492
	86	141	2.556	0.195	11.222	19.580
	87	142	2.797	1.573	11.302	19.848
	88	143	2.954	2.013	11.381	19.918
	89	144	3.086	3.238	11.461	20.225
55	90	145	3.194	3.294	11.541	20.239
	91	146	3.387	4.002	11.620	20.303
	92	147	3.482	3.600	11.700	20.211
	93	148	3.578	4.380	11.779	20.414
	94	149	3.697	3.623	11.859	20.195
56	87	143	2.929	0.421	11.381	19.469
	88	144	3.086	0.861	11.461	19.544
	89	145	3.220	2.084	11.541	19.874
	90	146	3.328	2.140	11.620	19.884
	91	147	3.522	2.847	11.700	19.958
56	92	148	3.618	2.444	11.779	19.852
	93	149	3.714	3.224	11.859	20.068
	94	150	3.834	2.466	11.939	19.828
	95	151	3.954	2.959	12.018	19.927
	96	152	4.087	1.897	12.098	19.574
57	89	146	3.589	3.595	11.620	19.927
	90	147	3.699	3.649	11.700	19.929
	91	148	3.894	4.355	11.779	19.969
	92	149	3.990	3.952	11.859	19.869
	93	150	4.087	4.731	11.939	20.054
57	94	151	4.208	3.972	12.018	19.830
	95	152	4.328	4.465	12.098	19.906
	96	153	4.462	3.402	12.177	19.577
	97	154	4.619	3.613	12.257	19.526
	98	155	4.789	2.260	12.336	19.039
58	91	149	3.911	4.598	11.859	20.137
	92	150	4.009	4.193	11.939	20.036
	93	151	4.106	4.972	12.018	20.217
	94	152	4.228	4.212	12.098	19.992
	95	153	4.349	4.704	12.177	20.063

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
58	96	154	4.483	3.641	12.257	19.734
	97	155	4.642	3.850	12.336	19.678
	98	156	4.813	2.496	12.416	19.191
	99	157	5.008	2.402	12.496	18.993
	100	158	5.216	0.790	12.575	18.334
59	91	150	3.930	6.449	11.939	20.656
	92	151	4.028	6.044	12.018	20.567
	93	152	4.126	6.822	12.098	20.720
	94	153	4.248	6.062	12.177	20.518
	95	154	4.371	6.552	12.257	20.571
59	96	155	4.506	5.488	12.336	20.272
	97	156	4.666	5.696	12.416	20.205
	98	157	4.838	4.341	12.496	19.755
	99	158	5.035	4.245	12.575	19.552
	100	159	5.244	2.632	12.655	18.934
60	93	153	4.171	6.117	12.177	20.643
	94	154	4.295	5.355	12.257	20.426
	95	155	4.419	5.844	12.336	20.483
	96	156	4.555	4.779	12.416	20.165
	97	157	4.716	4.986	12.496	20.097
60	98	158	4.889	3.630	12.575	19.624
	99	159	5.087	3.533	12.655	19.415
	100	160	5.298	1.918	12.734	18.771
	101	161	4.503	5.599	12.814	21.086
	102	162	4.473	5.296	12.894	21.193
61	95	156	4.493	6.920	12.416	20.726
	96	157	4.630	5.854	12.496	20.424
	97	158	4.792	6.060	12.575	20.346
	98	159	4.967	4.702	12.655	19.893
	99	160	5.167	4.603	12.734	19.677
61	100	161	5.379	2.987	12.814	19.054
	101	162	4.578	6.674	12.894	21.336
	102	163	4.547	6.372	12.973	21.452
	103	164	4.553	6.728	13.053	21.652
	104	165	4.604	5.892	13.132	21.515

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
62	97	159	4.883	4.539	12.655	19.984
	98	160	5.059	3.180	12.734	19.489
	99	161	5.261	3.079	12.814	19.266
	100	162	5.475	1.461	12.894	18.596
	101	163	4.667	5.155	12.973	20.983
62	102	164	4.636	4.853	13.053	21.088
	103	165	4.641	5.210	13.132	21.295
	104	166	4.693	4.373	13.212	21.130
	105	167	5.424	2.672	13.292	19.603
	106	168	5.102	3.061	13.371	20.361
63	99	162	5.395	3.385	12.894	19.251
	100	163	5.611	1.765	12.973	18.581
	101	164	4.796	5.466	13.053	20.977
	102	165	4.765	5.164	13.132	21.084
	103	166	4.770	5.521	13.212	21.289
63	104	167	4.823	4.683	13.292	21.126
	105	168	5.559	2.977	13.371	19.581
	106	169	5.234	3.369	13.451	20.348
	107	170	4.972	5.167	13.530	21.376
	108	171	4.798	4.951	13.610	21.742
64	101	165	4.941	3.261	13.132	20.309
	102	166	4.910	2.959	13.212	20.399
	103	167	4.915	3.316	13.292	20.614
	104	168	4.968	2.478	13.371	20.412
	105	169	5.710	0.766	13.451	18.799
64	106	170	5.382	1.161	13.530	19.573
	107	171	5.118	2.961	13.610	20.668
	108	172	4.942	2.747	13.690	21.021
	109	173	4.780	4.014	13.769	21.777
	110	174	4.685	3.348	13.849	21.875
65	102	167	5.869	2.820	13.292	18.906
	103	168	5.873	3.178	13.371	19.108
	104	169	5.926	2.340	13.451	18.905
	105	170	6.674	0.622	13.530	17.252
	106	171	6.343	1.020	13.610	18.036

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
65	107	172	6.075	2.824	13.690	19.116
	108	173	5.897	2.612	13.769	19.478
	109	174	5.734	3.880	13.849	20.223
	110	175	5.637	3.216	13.928	20.329
	111	176	5.544	3.988	14.008	20.820
66	104	170	5.728	2.408	13.530	19.369
	105	171	6.484	0.682	13.610	17.696
	106	172	6.149	1.084	13.690	18.491
	107	173	5.880	2.889	13.769	19.586
	108	174	5.700	2.679	13.849	19.952
66	109	175	5.535	3.949	13.928	20.707
	110	176	5.437	3.286	14.008	20.814
	111	177	5.343	4.059	14.088	21.312
	112	178	5.303	2.976	14.167	21.196
	113	179	5.295	3.207	14.247	21.397
67	106	173	6.019	3.504	13.769	19.508
	107	174	5.747	5.312	13.849	20.557
	108	175	5.566	5.103	13.928	20.948
	109	176	5.399	6.375	14.008	21.664
	110	177	5.300	5.713	14.088	21.810
67	111	178	5.206	6.486	14.167	22.285
	112	179	5.166	5.403	14.247	22.223
	113	180	5.157	5.635	14.326	22.420
	114	181	5.154	4.205	14.406	22.174
	115	182	5.142	3.986	14.486	22.257
68	108	176	5.483	4.396	14.008	21.034
	109	177	5.315	5.669	14.088	21.773
	110	178	5.216	5.007	14.167	21.909
	111	179	5.120	5.782	14.247	22.398
	112	180	5.080	4.699	14.326	22.318
68	113	181	5.071	4.931	14.406	22.519
	114	182	5.068	3.501	14.486	22.249
	115	183	5.056	3.282	14.565	22.328
	116	184	5.048	1.567	14.645	21.912
	117	185	5.027	0.890	14.724	21.835

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
69	110	179	5.170	6.673	14.247	22.516
	111	180	5.074	7.448	14.326	22.988
	112	181	5.033	6.366	14.406	22.947
	113	182	5.024	6.598	14.486	23.144
	114	183	5.021	5.168	14.565	22.922
69	115	184	5.009	4.949	14.645	23.012
	116	185	5.001	3.234	14.724	22.655
	117	186	4.979	2.558	14.804	22.603
	118	187	4.911	0.617	14.883	22.177
	119	188	4.098	3.431	14.963	24.713
70	112	182	5.027	5.012	14.486	22.745
	113	183	5.018	5.244	14.565	22.947
	114	184	5.015	3.814	14.645	22.681
	115	185	5.002	3.596	14.724	22.763
	116	186	4.995	1.880	14.804	22.353
70	117	187	4.973	1.204	14.883	22.279
	118	188	4.903	-0.734	14.963	21.791
	119	189	4.083	2.086	15.043	24.414
	120	190	3.826	1.808	15.122	24.893
	121	191	3.574	1.885	15.202	25.491

4. LEVEL DENSITY PARAMETERS FOR $76 \leq Z \leq 126$ ($181 \leq A \leq 338$)

4.1. FOREWORD :

The following pages (pp. 4.2 - 4.23) cover the atomic number range $76 \leq Z \leq 126$, $181 \leq A \leq 338$. This is a most interesting region for several reasons. The lightest of the group are transitional elements. They are known to have higher modes (orders) of deformation coexistant with lower modes near ground states. The effects of $\beta - \gamma$ vibrations has been estimated from the Davydov-Filipov model[1]. In addition, the octupole mode has been included. With these refinements, results in this region ($185 \leq A \leq 205$) are slightly different from our earlier work[2].

The mass 205-210 region has abnormally low a-values (deduced from experiments) associated with near doubly magic configuration. Beyond Pb-Bi, experimental information is lacking upto $Z = 89$. Fair agreement with our predictions is obtained in Th and actinides upto Cm, as noted in ref.[2].

The rest of the presentation (Table 3) is concerned with light superheavy elements upto $Z = 126$. This speculative region has been studied using Nilsson's level scheme[3]. An elementary version of this work has already been reported[4] .

4.2. REFERENCES :

1. A. S. Davydov and G. F. Filipov, Nucl. Phys. 8(1958)237 .
2. S. K. Ghosh and A.Chatterjee,Phys.Rev.C7(1973)840;C8(1973)423.
3. See ref.[15] in Sec. 1.7 .
4. S. K. Ghosh and A. Chatterjee, Proc. Intern. Conf. on Nuclear Structure Study with Neutrons, Budapest, 1972, p.182.

4.3. THE TABLE (TABLE 3) :

See comments and explanations in Sec. 1.6 .

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
76	105	181	6.577	-3.695	14.389	14.366
	106	182	6.223	-3.283	14.469	15.561
	107	183	5.935	-1.461	14.548	17.949
	108	184	5.708	-1.611	14.628	18.349
	109	185	5.536	-0.334	14.707	19.921
76	110	186	5.413	-0.975	14.787	19.699
	111	187	5.332	-0.225	14.866	20.620
	112	188	5.284	-1.289	14.946	19.879
	113	189	5.261	-1.043	15.025	20.252
	114	190	5.254	-2.465	15.105	19.044
76	115	191	5.253	-2.698	15.184	18.920
	116	192	5.246	-4.414	15.264	17.307
	117	193	5.221	-5.093	15.343	16.741
	118	194	5.165	-7.035	15.423	14.854
	119	195	4.276	-4.155	15.502	19.898
76	120	196	4.003	-4.419	15.582	20.309
	121	197	3.725	-4.316	15.661	21.102
77	109	186	5.337	2.655	14.787	22.769
	110	187	5.215	2.013	14.866	22.633
	111	188	5.151	2.746	14.946	23.398
	112	189	5.146	1.640	15.025	22.714
	113	190	5.176	1.832	15.105	22.927
77	114	191	5.231	0.349	15.184	21.749
	115	192	5.304	0.042	15.264	21.459
	116	193	5.392	-1.769	15.343	19.736
	117	194	5.402	-2.482	15.423	19.124
	118	195	5.342	-4.422	15.502	17.363
77	119	196	1.974	0.938	15.582	28.588
	120	197	1.786	0.588	15.661	28.828
	121	198	1.595	0.605	15.741	29.299
78	109	187	5.358	1.810	14.866	22.229
	110	188	5.236	1.167	14.946	22.063
	111	189	5.185	1.888	15.025	22.834
	112	190	5.179	0.781	15.105	22.090
	113	191	5.211	0.973	15.184	22.305

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
78	114	192	5.274	-0.518	15.264	21.022
	115	193	5.369	-0.847	15.343	20.647
	116	194	5.403	-2.604	15.423	19.000
	117	195	5.388	-3.293	15.502	18.435
	118	196	5.299	-5.203	15.582	16.715
78	119	197	1.922	0.165	15.661	28.333
	120	198	1.734	-0.184	15.741	28.565
	121	199	1.543	-0.167	15.820	29.047
	122	200	1.341	-0.839	15.900	29.091
	123	201	1.221	-3.897	15.979	27.078
79	111	190	5.212	1.502	15.105	22.608
	112	191	5.206	0.396	15.184	21.835
	113	192	5.245	0.580	15.264	22.030
	114	193	5.330	-0.933	15.343	20.645
	115	194	5.372	-1.209	15.423	20.411
79	116	195	5.382	-2.942	15.502	18.803
	117	196	5.338	-3.602	15.582	18.317
	118	197	5.229	-5.491	15.661	16.642
	119	198	4.529	-2.800	15.741	21.030
	120	199	4.018	-2.827	15.820	22.172
79	121	200	3.485	-2.468	15.900	23.716
	122	201	2.947	-2.804	15.979	24.614
	123	202	2.635	-5.670	16.059	22.592
80	111	191	5.265	-2.431	15.184	19.154
	112	192	5.267	-3.545	15.264	18.150
	113	193	5.326	-3.381	15.343	18.286
	114	194	5.359	-4.843	15.423	16.796
	115	195	5.378	-5.096	15.502	16.573
80	116	196	5.361	-6.801	15.582	14.834
	117	197	5.297	-7.441	15.661	14.338
	118	198	5.142	-9.286	15.741	12.660
	119	199	4.450	-6.601	15.820	17.317
	120	200	3.908	-6.597	15.900	18.613

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
80	121	201	3.378	-6.242	15.979	20.266
	122	202	2.868	-6.606	16.059	21.100
	123	203	2.557	-9.473	16.138	18.713
	124	204	2.050	-12.699	16.218	16.192
	125	205	1.243	-14.760	16.297	15.684
80	126	206	0.393	-17.433	16.377	14.505
	127	207	1.179	-11.756	16.456	19.616
	128	208	1.654	-6.578	16.536	24.477
	129	209	2.157	-5.638	16.615	24.468
	130	210	2.572	-5.493	16.695	23.816
81	120	201	3.637	-9.417	15.979	16.138
	121	202	3.140	-9.094	16.059	17.725
	122	203	2.632	-9.459	16.138	18.557
	123	204	2.324	-12.331	16.218	15.991
	124	205	1.828	-15.566	16.297	13.336
81	125	206	1.012	-17.620	16.377	12.822
	126	207	0.149	-20.279	16.456	11.669
	127	208	1.025	-14.693	16.536	16.515
	128	209	1.506	-9.520	16.615	21.670
	129	210	2.015	-8.586	16.695	21.664
82	117	199	4.929	-14.087	15.820	7.674
	118	200	4.737	-15.894	15.900	6.082
	119	201	4.008	-13.174	15.979	10.904
	120	202	3.505	-13.209	16.059	12.073
	121	203	3.008	-12.886	16.138	13.668
82	122	204	2.501	-13.252	16.218	14.479
	123	205	2.206	-16.136	16.297	11.767
	124	206	1.707	-19.369	16.377	9.106
	125	207	0.877	-21.409	16.456	8.632
	126	208	0.000	-24.053	16.536	7.555
82	127	209	0.937	-18.528	16.615	12.071
	128	210	1.423	-13.361	16.695	17.361
	129	211	1.938	-12.433	16.774	17.343
	130	212	2.364	-12.298	16.854	16.563
	131	213	2.725	-11.555	16.933	16.685

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
83	120	203	1.860	-7.605	16.138	22.361
	121	204	1.669	-7.588	16.218	22.913
	122	205	1.467	-8.260	16.297	22.746
	123	206	1.347	-11.318	16.377	19.646
	124	207	1.135	-14.838	16.456	15.997
83	125	208	0.779	-17.352	16.536	13.829
	126	209	0.400	-20.494	16.615	10.929
	127	210	1.011	-14.643	16.695	16.770
	128	211	1.329	-9.308	16.774	22.539
	129	212	1.666	-8.202	16.854	23.125
83	130	213	1.946	-7.921	16.933	22.904
	131	214	2.183	-7.054	17.013	23.441
	132	215	2.393	-7.226	17.092	22.864
	133	216	2.589	-6.654	17.172	23.164
	134	217	2.779	-7.264	17.251	22.115
84	120	204	2.097	-0.263	16.218	28.728
	121	205	1.906	-0.246	16.297	29.225
	122	206	1.704	-0.918	16.377	29.247
	123	207	1.584	-3.976	16.456	27.075
	124	208	1.372	-7.497	16.536	24.127
84	125	209	1.016	-10.010	16.615	22.245
	126	210	0.637	-13.153	16.695	19.503
	127	211	1.248	-7.301	16.774	24.968
	128	212	1.566	-1.966	16.854	29.536
	129	213	1.904	-0.861	16.933	29.905
84	130	214	2.183	-0.579	17.013	29.729
	131	215	2.420	0.286	17.092	30.080
	132	216	2.631	0.115	17.172	29.686
	133	217	2.826	0.687	17.251	29.890
	134	218	3.016	0.077	17.331	29.172
85	120	205	2.220	-0.225	16.297	28.674
	121	206	2.029	-0.208	16.377	29.174
	122	207	1.827	-0.880	16.456	29.191
	123	208	1.706	-3.938	16.536	26.988
	124	209	1.495	-7.459	16.615	24.008

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
85	125	210	1.139	-9.972	16.695	22.109
	126	211	0.759	-13.115	16.774	19.348
	127	212	1.371	-7.263	16.854	24.850
	128	213	1.689	-1.928	16.933	29.465
	129	214	2.026	-0.823	17.013	29.839
85	130	215	2.305	-0.541	17.092	29.661
	131	216	2.543	0.324	17.172	30.016
	132	217	2.753	0.153	17.251	29.616
	133	218	2.948	0.725	17.331	29.822
	134	219	3.138	0.115	17.410	29.093
86	122	208	1.965	-0.833	16.536	29.109
	123	209	1.845	-3.891	16.615	26.873
	124	210	1.633	-7.412	16.695	23.861
	125	211	1.277	-9.925	16.774	21.943
	126	212	0.898	-13.068	16.854	19.162
86	127	213	1.509	-7.216	16.933	24.702
	128	214	1.827	-1.881	17.013	29.368
	129	215	2.165	-0.776	17.092	29.747
	130	216	2.444	-0.494	17.172	29.565
	131	217	2.681	0.371	17.251	29.926
86	132	218	2.892	0.200	17.331	29.518
	133	219	3.087	0.772	17.410	29.726
	134	220	3.277	0.162	17.490	28.986
	135	221	3.470	0.402	17.569	28.929
	136	222	3.672	-0.625	17.649	27.721
87	128	215	1.939	-1.816	17.092	29.335
	129	216	2.277	-0.711	17.172	29.718
	130	217	2.556	-0.429	17.251	29.534
	131	218	2.793	0.436	17.331	29.897
	132	219	3.004	0.265	17.410	29.485
87	133	220	3.199	0.837	17.490	29.694
	134	221	3.389	0.227	17.569	28.945
	135	222	3.582	0.467	17.649	28.887
	136	223	3.784	-0.560	17.728	27.666
	137	224	5.064	-1.417	17.808	24.055

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
87	138	225	4.923	-0.907	17.887	25.030
	139	226	4.786	0.935	17.967	27.278
	140	227	4.664	0.984	18.046	27.709
	141	228	4.563	2.482	18.126	29.357
	142	229	4.489	2.102	18.205	29.322
88	131	219	2.892	0.461	17.410	29.862
	132	220	3.102	0.290	17.490	29.444
	133	221	3.297	0.862	17.569	29.654
	134	222	3.488	0.252	17.649	28.895
	135	223	3.680	0.492	17.728	28.836
88	136	224	3.882	-0.535	17.808	27.600
	137	225	5.163	-1.392	17.887	23.960
	138	226	5.022	-0.882	17.967	24.941
	139	227	4.885	0.960	18.046	27.208
	140	228	4.763	1.009	18.126	27.641
88	141	229	4.662	2.507	18.205	29.305
	142	230	4.587	2.127	18.285	29.266
	143	231	4.541	3.261	18.364	30.415
	144	232	4.525	2.490	18.444	29.958
	145	233	4.538	3.248	18.523	30.675
89	132	221	3.198	0.276	17.569	29.373
	133	222	3.393	0.848	17.649	29.587
	134	223	3.583	0.238	17.728	28.815
	135	224	3.776	0.478	17.808	28.754
	136	225	3.978	-0.549	17.887	27.501
89	137	226	5.259	-1.406	17.967	23.827
	138	227	5.117	-0.896	18.046	24.815
	139	228	4.981	0.946	18.126	27.105
	140	229	4.859	0.995	18.205	27.540
	141	230	4.758	2.493	18.285	29.224
89	142	231	4.683	2.113	18.364	29.181
	143	232	4.637	3.247	18.444	30.345
	144	233	4.621	2.476	18.523	29.877
	145	234	4.634	3.234	18.603	30.602
	146	235	4.675	2.110	18.682	29.699

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
90	136	226	4.100	-0.074	17.967	27.813
	137	227	5.409	-0.905	18.046	24.127
	138	228	5.298	-0.314	18.126	25.124
	139	229	5.188	1.479	18.205	27.279
	140	230	5.088	1.624	18.285	27.752
90	141	231	5.006	3.089	18.364	29.340
	142	232	4.948	2.809	18.444	29.352
	143	233	4.916	3.927	18.523	30.448
	144	234	4.915	3.251	18.603	30.043
	145	235	4.946	4.010	18.682	30.715
90	146	236	5.008	2.968	18.762	29.869
	147	237	5.101	3.361	18.841	30.133
	148	238	5.225	1.987	18.921	28.759
	149	239	5.376	2.008	19.000	28.560
	150	240	5.552	0.336	19.080	26.548
91	134	225	3.784	1.213	17.887	29.498
	135	226	3.992	1.375	17.967	29.339
	136	227	4.211	0.393	18.046	28.136
	137	228	5.520	-0.437	18.126	24.480
	138	229	5.409	0.154	18.205	25.469
91	139	230	5.299	1.947	18.285	27.596
	140	231	5.199	2.092	18.364	28.065
	141	232	5.117	3.557	18.444	29.625
	142	233	5.059	3.277	18.523	29.642
	143	234	5.028	4.396	18.603	30.715
91	144	235	5.026	3.719	18.682	30.324
	145	236	5.057	4.478	18.762	30.982
	146	237	5.119	3.437	18.841	30.160
	147	238	5.212	3.829	18.921	30.418
	148	239	5.336	2.455	19.000	29.075
92	136	228	4.336	-1.321	18.126	26.280
	137	229	5.646	-2.151	18.205	22.364
	138	230	5.535	-1.560	18.285	23.412
	139	231	5.425	0.233	18.364	25.738
	140	232	5.325	0.377	18.444	26.231

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
92	141	233	5.243	1.843	18.523	27.980
	142	234	5.184	1.562	18.603	27.963
	143	235	5.153	2.681	18.682	29.185
	144	236	5.152	2.004	18.762	28.694
	145	237	5.182	2.764	18.841	29.444
92	146	238	5.244	1.722	18.921	28.461
	147	239	5.338	2.114	19.000	28.749
	148	240	5.461	0.741	19.080	27.197
	149	241	5.613	0.761	19.159	26.972
	150	242	5.789	-0.909	19.239	24.765
93	137	230	6.284	-1.824	18.285	21.279
	138	231	6.173	-1.233	18.364	22.339
	139	232	6.063	0.560	18.444	24.710
	140	233	5.963	0.705	18.523	25.206
	141	234	5.881	2.170	18.603	26.999
93	142	235	5.822	1.890	18.682	26.970
	143	236	5.791	3.008	18.762	28.226
	144	237	5.790	2.331	18.841	27.707
	145	238	5.820	3.091	18.921	28.478
	146	239	5.882	2.049	19.000	27.452
93	147	240	5.976	2.442	19.080	27.744
	148	241	6.100	1.068	19.159	26.139
	149	242	6.251	1.089	19.239	25.903
	150	243	6.427	-0.582	19.318	23.638
	151	244	6.624	-0.933	19.398	22.800
94	137	231	6.137	-1.678	18.364	21.906
	138	232	6.026	-1.087	18.444	22.962
	139	233	5.916	0.706	18.523	25.315
	140	234	5.816	0.850	18.603	25.810
	141	235	5.734	2.316	18.682	27.582
94	142	236	5.676	2.035	18.762	27.559
	143	237	5.645	3.154	18.841	28.797
	144	238	5.644	2.477	18.921	28.292
	145	239	5.674	3.237	19.000	29.052
	146	240	5.736	2.195	19.080	28.047

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
94	147	241	5.829	2.587	19.159	28.336
	148	242	5.953	1.214	19.239	26.757
	149	243	6.105	1.234	19.318	26.525
	150	244	6.281	-0.436	19.398	24.284
	151	245	6.477	-0.788	19.477	23.453
95	142	237	5.551	4.393	18.841	30.053
	143	238	5.520	5.511	18.921	31.097
	144	239	5.518	4.834	19.000	30.723
	145	240	5.549	5.594	19.080	31.361
	146	241	5.611	4.552	19.159	30.566
95	147	242	5.704	4.945	19.239	30.816
	148	243	5.828	3.571	19.318	29.505
	149	244	5.979	3.592	19.398	29.310
	150	245	6.156	1.920	19.477	27.359
	151	246	6.352	1.569	19.557	26.617
95	152	247	6.563	-0.363	19.636	23.943
	153	248	5.272	3.187	19.716	30.999
	154	249	5.095	3.180	19.795	31.511
	155	250	4.942	4.162	19.875	32.807
	156	251	4.810	3.820	19.954	32.939
96	141	237	5.509	4.196	18.841	29.978
	142	238	5.451	3.915	18.921	29.994
	143	239	5.420	5.034	19.000	31.072
	144	240	5.419	4.357	19.080	30.677
	145	241	5.449	5.117	19.159	31.337
96	146	242	5.511	4.075	19.239	30.506
	147	243	5.604	4.467	19.318	30.763
	148	244	5.728	3.094	19.398	29.406
	149	245	5.880	3.114	19.477	29.204
	150	246	6.056	1.443	19.557	27.199
96	151	247	6.252	1.091	19.636	26.439
	152	248	6.463	-0.841	19.716	23.711
	153	249	5.173	2.710	19.795	30.907
	154	250	4.995	2.702	19.875	31.425
	155	251	4.842	3.684	19.954	32.757

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
97	145	242	5.376	6.977	19.239	32.866
	146	243	5.438	5.935	19.318	32.212
	147	244	5.532	6.328	19.398	32.434
	148	245	5.655	4.954	19.477	31.307
	149	246	5.807	4.975	19.557	31.135
97	150	247	5.983	3.303	19.636	29.389
	151	248	6.179	2.952	19.716	28.709
	152	249	6.390	1.019	19.795	26.225
	153	250	5.100	4.571	19.875	32.803
	154	251	4.922	4.563	19.954	33.297
97	155	252	4.769	5.545	20.034	34.455
	156	253	4.638	5.204	20.113	34.616
	157	254	4.523	5.820	20.193	35.389
	158	255	4.420	5.184	20.272	35.309
	159	256	4.324	5.444	20.352	35.808
98	146	244	5.392	4.925	19.398	31.695
	147	245	5.486	5.317	19.477	31.935
	148	246	5.609	3.944	19.557	30.685
	149	247	5.761	3.964	19.636	30.497
	150	248	5.937	2.293	19.716	28.608
98	151	249	6.133	1.941	19.795	27.882
	152	250	6.344	0.008	19.875	25.257
	153	251	5.054	3.560	19.954	32.192
	154	252	4.876	3.552	20.034	32.701
	155	253	4.724	4.534	20.113	33.953
98	156	254	4.592	4.193	20.193	34.098
	157	255	4.477	4.810	20.272	34.933
	158	256	4.374	4.174	20.352	34.808
	159	257	4.278	4.434	20.431	35.338
	160	258	4.184	3.542	20.511	34.984
99	149	248	5.741	5.314	19.716	31.800
	150	249	5.917	3.642	19.795	30.100
	151	250	6.113	3.291	19.875	29.433
	152	251	6.324	1.358	19.954	26.990
	153	252	5.034	4.910	20.034	33.467

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
99	154	253	4.856	4.902	20.113	33.958
	155	254	4.703	5.884	20.193	35.083
	156	255	4.571	5.543	20.272	35.253
	157	256	4.456	6.159	20.352	36.003
	158	257	4.354	5.523	20.431	35.942
99	159	258	4.258	5.783	20.511	36.431
	160	259	4.164	4.892	20.590	36.173
	161	260	4.065	4.810	20.670	36.455
	162	261	3.954	3.702	20.749	36.011
	163	262	3.824	3.295	20.829	36.106
100	148	248	5.592	3.829	19.716	30.871
	149	249	5.743	3.850	19.795	30.679
	150	250	5.920	2.178	19.875	28.761
	151	251	6.116	1.827	19.954	28.025
	152	252	6.327	-0.105	20.034	25.365
100	153	253	5.036	3.445	20.113	32.386
	154	254	4.859	3.438	20.193	32.900
	155	255	4.706	4.420	20.272	34.169
	156	256	4.574	4.079	20.352	34.313
	157	257	4.459	4.695	20.431	35.159
100	158	258	4.357	4.059	20.511	35.027
	159	259	4.261	4.319	20.590	35.563
	160	260	4.167	3.427	20.670	35.199
	161	261	4.068	3.345	20.749	35.482
	162	262	3.957	2.238	20.829	34.908
101	149	250	5.766	4.673	19.875	31.476
	150	251	5.942	3.002	19.954	29.662
	151	252	6.139	2.650	20.034	28.958
	152	253	6.350	0.718	20.113	26.397
	153	254	5.059	4.269	20.193	33.169
101	154	255	4.882	4.261	20.272	33.673
	155	256	4.729	5.244	20.352	34.871
	156	257	4.597	4.902	20.431	35.029
	157	258	4.482	5.519	20.511	35.828
	158	259	4.380	4.883	20.590	35.732

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
101	159	260	4.284	5.143	20.670	36.245
	160	261	4.190	4.251	20.749	35.936
	161	262	4.091	4.169	20.829	36.219
	162	263	3.980	3.061	20.908	35.711
	163	264	3.850	2.655	20.988	35.789
102	150	252	5.981	1.155	20.034	27.727
	151	253	6.177	0.803	20.113	26.938
	152	254	6.388	-1.129	20.193	24.118
	153	255	5.098	2.422	20.272	31.547
	154	256	4.920	2.414	20.352	32.077
102	155	257	4.767	3.396	20.431	33.456
	156	258	4.636	3.055	20.511	33.579
	157	259	4.521	3.671	20.590	34.497
	158	260	4.418	3.036	20.670	34.312
	159	261	4.322	3.296	20.749	34.883
102	160	262	4.228	2.404	20.829	34.438
	161	263	4.129	2.322	20.908	34.723
	162	264	4.018	1.214	20.988	34.050
	163	265	3.888	0.807	21.067	34.082
	164	266	3.434	2.862	21.146	37.158
103	152	255	6.437	-0.844	20.272	24.446
	153	256	5.146	2.706	20.352	31.834
	154	257	4.969	2.698	20.431	32.362
	155	258	4.816	3.681	20.511	33.725
	156	259	4.684	3.339	20.590	33.852
103	157	260	4.569	3.956	20.670	34.760
	158	261	4.466	3.320	20.749	34.584
	159	262	4.371	3.580	20.829	35.150
	160	263	4.277	2.688	20.908	34.718
	161	264	4.178	2.606	20.988	35.003
103	162	265	4.067	1.498	21.067	34.346
	163	266	3.937	1.092	21.146	34.382
	164	267	3.483	3.146	21.226	37.420
	165	268	2.884	1.625	21.306	37.629
	166	269	2.696	1.281	21.385	37.897

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
104	154	258	5.099	0.618	20.511	30.016
	155	259	5.803	0.253	20.590	27.897
	156	260	5.501	0.511	20.670	29.098
	157	261	5.232	1.878	20.749	31.407
	158	262	4.991	1.800	20.829	32.037
104	159	263	4.773	2.794	20.908	33.669
	160	264	4.572	2.427	20.988	33.921
	161	265	4.380	3.058	21.067	35.079
	162	266	4.190	2.449	21.146	35.094
	163	267	3.995	2.731	21.226	35.934
104	164	268	3.784	1.927	21.306	35.823
	165	269	3.550	1.878	21.385	36.461
	166	270	3.281	0.933	21.465	36.338
	167	271	2.968	0.574	21.544	36.878
	168	272	2.751	-4.109	21.624	32.193
105	156	261	5.388	1.874	20.749	31.018
	157	262	5.119	3.241	20.829	33.158
	158	263	4.878	3.164	20.908	33.771
	159	264	4.661	4.157	20.988	35.261
	160	265	4.459	3.790	21.067	35.533
105	161	266	4.267	4.421	21.146	36.589
	162	267	4.078	3.812	21.226	36.659
	163	268	3.882	4.094	21.306	37.436
	164	269	3.672	3.291	21.385	37.403
	165	270	3.438	3.242	21.465	38.016
105	166	271	3.169	2.296	21.544	37.979
	167	272	2.856	1.937	21.624	38.523
	168	273	2.638	-2.746	21.703	34.944
	169	274	2.167	-5.252	21.783	32.572
	170	275	1.538	-8.039	21.862	30.624
106	158	264	4.779	2.211	20.988	33.216
	159	265	4.561	3.204	21.067	34.797
	160	266	4.360	2.837	21.146	35.059
	161	267	4.168	3.469	21.226	36.179
	162	268	3.978	2.859	21.306	36.219

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
106	163	269	3.783	3.142	21.385	37.036
	164	270	3.572	2.338	21.465	36.959
	165	271	3.338	2.289	21.544	37.590
	166	272	3.069	1.343	21.624	37.504
	167	273	2.756	0.984	21.703	38.050
106	168	274	2.539	-3.699	21.783	33.557
	169	275	2.068	-6.205	21.862	31.671
	170	276	1.438	-8.992	21.942	29.624
	171	277	1.520	1.987	22.021	42.220
	172	278	1.587	1.981	22.101	42.226
107	160	267	4.265	3.644	21.226	36.109
	161	268	4.074	4.275	21.306	37.166
	162	269	3.884	3.666	21.385	37.239
	163	270	3.688	3.948	21.465	38.019
	164	271	3.478	3.145	21.544	37.990
107	165	272	3.244	3.096	21.624	38.606
	166	273	2.975	2.150	21.703	38.574
	167	274	2.662	1.791	21.783	39.123
	168	275	2.445	-2.892	21.862	34.945
	169	276	1.974	-5.399	21.942	33.170
107	170	277	1.344	-8.185	22.021	31.217
	171	278	1.426	2.793	22.101	43.095
	172	279	1.493	2.787	22.180	43.111
	173	280	1.895	2.642	22.260	42.338
	174	281	1.995	2.714	22.339	42.329
108	162	270	3.787	2.404	21.465	36.523
	163	271	3.591	2.686	21.544	37.356
	164	272	3.381	1.882	21.624	37.268
	165	273	3.147	1.833	21.703	37.907
	166	274	2.878	0.887	21.783	37.808
108	167	275	2.565	0.529	21.862	38.357
	168	276	2.347	-4.154	21.942	33.752
	169	277	1.877	-6.661	22.021	31.824
	170	278	1.247	-9.448	22.101	29.736
	171	279	1.328	1.531	22.180	42.608

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
108	172	280	1.396	1.525	22.260	42.611
	173	281	1.798	1.380	22.339	41.759
	174	282	1.898	1.452	22.419	41.740
	175	283	1.965	1.854	22.498	42.057
	176	284	2.005	1.664	22.578	41.965
109	164	273	3.271	2.122	21.703	37.874
	165	274	3.037	2.073	21.783	38.509
	166	275	2.769	1.127	21.862	38.432
	167	276	2.455	0.768	21.942	38.984
	168	277	2.238	-3.915	22.021	34.492
109	169	278	1.767	-6.421	22.101	32.603
	170	279	1.137	-9.208	22.180	30.546
	171	280	1.219	1.771	22.260	43.165
	172	281	1.286	1.765	22.339	43.172
	173	282	1.689	1.619	22.419	42.341
109	174	283	1.788	1.691	22.498	42.326
	175	284	1.856	2.093	22.578	42.633
	176	285	1.895	1.904	22.657	42.551
	177	286	1.908	2.088	22.737	42.812
	178	287	1.896	1.668	22.816	42.661
110	166	276	2.636	-0.373	21.942	37.421
	167	277	2.323	-0.731	22.021	37.973
	168	278	2.105	-5.415	22.101	33.005
	169	279	1.634	-7.922	22.180	30.949
	170	280	1.005	-10.709	22.260	28.749
110	171	281	1.086	0.270	22.339	42.470
	172	282	1.153	0.264	22.419	42.462
	173	283	1.556	0.119	22.498	41.540
	174	284	1.656	0.191	22.578	41.513
	175	285	1.723	0.593	22.657	41.859
110	176	286	1.762	0.403	22.737	41.742
	177	287	1.776	0.588	22.816	42.023
	178	288	1.763	0.167	22.896	41.813
	179	289	1.724	0.115	22.975	42.006
	180	290	1.656	-0.500	23.055	41.723

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
111	168	279	1.938	-5.751	22.180	33.151
	169	280	1.467	-8.257	22.260	31.071
	170	281	0.838	-11.044	22.339	28.850
	171	282	0.919	-0.064	22.419	42.725
	172	283	0.986	-0.070	22.498	42.716
111	173	284	1.389	-0.216	22.578	41.782
	174	285	1.488	-0.144	22.657	41.754
	175	286	1.556	0.257	22.737	42.105
	176	287	1.595	0.068	22.816	41.984
	177	288	1.609	0.252	22.896	42.268
111	178	289	1.596	-0.168	22.975	42.052
	179	290	1.557	-0.219	23.055	42.246
	180	291	1.489	-0.836	23.134	41.955
	181	292	1.125	0.117	23.214	43.906
	182	293	1.047	-0.010	23.293	44.132
112	170	282	0.671	-14.258	22.419	24.258
	171	283	0.753	-3.278	22.498	40.117
	172	284	0.820	-3.284	22.578	40.074
	173	285	1.223	-3.430	22.657	38.954
	174	286	1.322	-3.358	22.737	38.903
112	175	287	1.390	-2.956	22.816	39.331
	176	288	1.429	-3.145	22.896	39.135
	177	289	1.442	-2.961	22.975	39.455
	178	290	1.430	-3.382	23.055	39.117
	179	291	1.390	-3.433	23.134	39.299
112	180	292	1.322	-4.050	23.214	38.853
	181	293	0.959	-3.096	23.293	41.181
	182	294	0.880	-3.224	23.373	41.388
	183	295	0.785	-3.263	23.452	41.747
	184	296	0.671	-4.147	23.532	41.141
113	172	285	0.550	-5.980	22.657	37.645
	173	286	0.952	-6.126	22.737	36.400
	174	287	1.052	-6.054	22.816	36.332
	175	288	1.119	-5.652	22.896	36.809
	176	289	1.159	-5.841	22.975	36.560

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
113	177	290	1.172	-5.657	23.055	36.901
	178	291	1.159	-6.078	23.134	36.480
	179	292	1.120	-6.129	23.214	36.652
	180	293	1.052	-6.746	23.293	36.101
	181	294	0.688	-5.792	23.373	38.675
113	182	295	0.610	-5.920	23.452	38.866
	183	296	0.515	-5.959	23.532	39.231
	184	297	0.401	-6.843	23.611	38.471
	185	298	0.918	-16.198	23.690	21.375
	186	299	1.307	-13.514	23.770	24.849
114	174	288	0.650	-9.418	22.896	32.749
	175	289	0.718	-9.016	22.975	33.270
	176	290	0.757	-9.205	23.055	32.967
	177	291	0.770	-9.021	23.134	33.325
	178	292	0.758	-9.442	23.214	32.821
114	179	293	0.719	-9.493	23.293	32.978
	180	294	0.650	-10.110	23.373	32.326
	181	295	0.287	-9.156	23.452	35.125
	182	296	0.209	-9.284	23.532	35.297
	183	297	0.114	-9.323	23.611	35.663
114	184	298	0.000	-10.207	23.690	34.751
	185	299	0.517	-19.562	23.770	16.872
	186	300	0.906	-16.878	23.850	20.354
	187	301	1.183	-14.057	23.929	24.481
	188	302	1.283	-10.376	24.009	30.628
115	176	291	0.951	-0.116	23.134	43.969
	177	292	0.964	0.068	23.214	44.250
	178	293	0.951	-0.352	23.293	44.058
	179	294	0.912	-0.404	23.373	44.257
	180	295	0.844	-1.021	23.452	43.997
115	181	296	0.481	-0.067	23.532	45.894
	182	297	0.402	-0.195	23.611	46.129
	183	298	0.307	-0.233	23.690	46.478
	184	299	0.193	-1.118	23.770	46.140
	185	300	0.710	-10.473	23.850	32.186

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
115	186	301	1.099	-7.788	23.929	35.346
	187	302	1.377	-4.968	24.009	38.770
	188	303	1.477	-1.287	24.088	43.233
	189	304	1.700	-0.578	24.168	43.538
	190	305	1.900	-0.558	24.247	43.164
116	178	294	1.089	-0.368	23.373	43.855
	179	295	1.050	-0.419	23.452	44.053
	180	296	0.982	-1.036	23.532	43.780
	181	297	0.618	-0.082	23.611	45.709
	182	298	0.540	-0.210	23.690	45.941
116	183	299	0.445	-0.249	23.770	46.292
	184	300	0.331	-1.133	23.850	45.936
	185	301	0.848	-10.489	23.929	31.804
	186	302	1.237	-7.804	24.009	34.991
	187	303	1.514	-4.984	24.088	38.453
116	188	304	1.614	-1.302	24.168	42.982
	189	305	1.837	-0.594	24.247	43.295
	190	306	2.038	-0.574	24.327	42.913
	191	307	2.223	-0.049	24.406	43.123
	192	308	2.399	-0.321	24.486	42.481
117	180	297	1.075	-0.569	23.611	44.147
	181	298	0.711	0.383	23.690	46.031
	182	299	0.633	0.255	23.770	46.266
	183	300	0.538	0.217	23.850	46.614
	184	301	0.424	-0.667	23.929	46.286
117	185	302	0.941	-10.022	24.009	32.377
	186	303	1.330	-7.337	24.088	35.535
	187	304	1.608	-4.517	24.168	38.949
	188	305	1.707	-0.836	24.247	43.385
	189	306	1.931	-0.127	24.327	43.684
117	190	307	2.131	-0.107	24.406	43.309
	191	308	2.316	0.417	24.486	43.509
	192	309	2.492	0.145	24.565	42.883
	193	310	2.663	0.462	24.645	42.900
	194	311	2.835	-0.096	24.724	41.928

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
118	182	300	0.689	-0.223	23.850	45.877
	183	301	0.593	-0.261	23.929	46.229
	184	302	0.479	-1.146	24.009	45.854
	185	303	0.997	-10.501	24.088	31.491
	186	304	1.385	-7.817	24.168	34.714
118	187	305	1.663	-4.996	24.247	38.225
	188	306	1.763	-1.315	24.327	42.838
	189	307	1.986	-0.607	24.406	43.159
	190	308	2.187	-0.586	24.486	42.769
	191	309	2.372	-0.062	24.565	42.984
118	192	310	2.547	-0.333	24.645	42.327
	193	311	2.719	-0.017	24.724	42.347
	194	312	2.890	-0.575	24.804	41.329
	195	313	3.066	-0.484	24.883	41.060
	196	314	3.250	-1.321	24.963	39.563
119	184	303	0.501	-0.990	24.088	46.099
	185	304	1.018	-10.346	24.168	31.785
	186	305	1.407	-7.661	24.247	35.005
	187	306	1.685	-4.840	24.327	38.506
	188	307	1.785	-1.159	24.406	43.096
119	189	308	2.008	-0.451	24.486	43.412
	190	309	2.208	-0.430	24.565	43.024
	191	310	2.393	0.093	24.645	43.235
	192	311	2.569	-0.178	24.724	42.582
	193	312	2.740	0.138	24.804	42.600
119	194	313	2.912	-0.420	24.883	41.588
	195	314	3.088	-0.329	24.963	41.320
	196	315	3.272	-1.166	25.042	39.831
	197	316	2.665	1.059	25.122	44.371
	198	317	2.688	1.188	25.201	44.583
120	186	306	1.395	-8.502	24.327	33.801
	187	307	1.673	-5.681	24.406	37.437
	188	308	1.772	-2.000	24.486	42.281
	189	309	1.995	-1.292	24.565	42.630
	190	310	2.196	-1.271	24.645	42.219

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
120	191	311	2.381	-0.746	24.724	42.451
	192	312	2.557	-1.018	24.804	41.755
	193	313	2.728	-0.702	24.883	41.778
	194	314	2.900	-1.260	24.963	40.701
	195	315	3.076	-1.169	25.042	40.419
120	196	316	3.259	-2.006	25.122	38.845
	197	317	2.653	0.219	25.201	43.623
	198	318	2.676	0.348	25.281	43.842
	199	319	2.702	1.090	25.360	44.723
	200	320	2.734	0.935	25.440	44.608
121	188	309	1.564	-0.974	24.565	44.196
	189	310	1.787	-0.266	24.645	44.496
	190	311	1.987	-0.245	24.724	44.117
	191	312	2.172	0.279	24.804	44.317
	192	313	2.348	0.007	24.883	43.683
121	193	314	2.519	0.323	24.963	43.699
	194	315	2.691	-0.234	25.042	42.716
	195	316	2.867	-0.143	25.122	42.452
	196	317	3.051	-0.980	25.201	40.999
	197	318	2.444	1.245	25.281	45.440
121	198	319	2.467	1.374	25.360	45.651
	199	320	2.494	2.116	25.440	46.444
	200	321	2.525	1.961	25.519	46.359
	201	322	2.565	2.456	25.599	46.864
	202	323	2.613	2.026	25.678	46.481
122	190	312	1.920	-0.520	24.804	44.142
	191	313	2.105	0.004	24.883	44.348
	192	314	2.281	-0.267	24.963	43.702
	193	315	2.452	0.049	25.042	43.719
	194	316	2.624	-0.509	25.122	42.717
122	195	317	2.800	-0.418	25.201	42.450
	196	318	2.984	-1.255	25.281	40.971
	197	319	2.377	0.970	25.360	45.482
	198	320	2.400	1.099	25.440	45.695
	199	321	2.427	1.842	25.519	46.504

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
122	200	322	2.458	1.686	25.599	46.415
	201	323	2.498	2.182	25.678	46.930
	202	324	2.546	1.751	25.758	46.534
	203	325	2.604	1.995	25.837	46.761
	204	326	2.674	1.303	25.917	46.013
123	192	315	2.189	-0.221	25.042	44.150
	193	316	2.360	0.094	25.122	44.166
	194	317	2.532	-0.463	25.201	43.173
	195	318	2.708	-0.372	25.281	42.907
	196	319	2.892	-1.209	25.360	41.440
123	197	320	2.285	1.015	25.440	45.921
	198	321	2.308	1.145	25.519	46.133
	199	322	2.335	1.887	25.599	46.933
	200	323	2.366	1.731	25.678	46.847
	201	324	2.406	2.227	25.758	47.356
123	202	325	2.454	1.797	25.837	46.968
	203	326	2.512	2.041	25.917	47.193
	204	327	2.582	1.348	25.996	46.456
	205	328	4.442	-1.091	26.076	37.802
	206	329	4.263	-0.765	26.155	38.987
124	194	318	2.411	-1.227	25.281	42.730
	195	319	2.587	-1.136	25.360	42.454
	196	320	2.770	-1.973	25.440	40.920
	197	321	2.164	0.252	25.519	45.591
	198	322	2.187	0.381	25.599	45.808
124	199	323	2.213	1.124	25.678	46.656
	200	324	2.245	0.968	25.758	46.555
	201	325	2.284	1.464	25.837	47.094
	202	326	2.333	1.034	25.917	46.670
	203	327	2.391	1.277	25.996	46.906
124	204	328	2.460	0.585	26.076	46.112
	205	329	4.321	-1.855	26.155	37.158
	206	330	4.141	-1.529	26.234	38.371
	207	331	3.982	-0.119	26.314	41.048
	208	332	3.843	-0.714	26.394	40.781

Z	N	MASS	DEF-E	DELTA E	A-ZERO	A-PAR
125	196	321	2.850	-9.018	25.519	29.351
	197	322	2.244	-6.793	25.599	35.502
	198	323	2.267	-6.664	25.678	35.748
	199	324	2.293	-5.921	25.758	37.004
	200	325	2.325	-6.077	25.837	36.750
125	201	326	2.364	-5.581	25.917	37.546
	202	327	2.413	-6.011	25.996	36.780
	203	328	2.471	-5.767	26.076	37.096
	204	329	2.540	-6.460	26.155	35.790
	205	330	4.401	-8.900	26.234	24.615
125	206	331	4.221	-8.574	26.314	25.979
	207	332	4.062	-7.164	26.394	29.292
	208	333	3.923	-7.132	26.473	29.954
	209	334	3.807	-5.975	26.553	32.583
	210	335	3.713	-6.219	26.632	32.587
126	198	324	2.325	-3.906	25.758	40.071
	199	325	2.351	-3.163	25.837	41.207
	200	326	2.383	-3.319	25.917	41.003
	201	327	2.423	-2.823	25.996	41.723
	202	328	2.471	-3.253	26.076	41.064
126	203	329	2.529	-3.010	26.155	41.358
	204	330	2.599	-3.702	26.234	40.209
	205	331	4.459	-6.143	26.314	29.607
	206	332	4.279	-5.817	26.394	30.946
	207	333	4.120	-4.407	26.473	34.107
126	208	334	3.981	-4.375	26.553	34.761
	209	335	3.865	-3.218	26.632	37.222
	210	336	3.771	-3.462	26.712	37.261
	211	337	3.699	-2.562	26.791	39.082
	212	338	3.648	-3.062	26.871	38.570