ANL/NDM-11

MEASURED AND EVALUATED FAST NEUTRON CROSS SECTIONS OF ELEMENTAL NICKEL

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July 1975

In January 1975, the research and development functions of the former U.S. Atomic Energy Commission were incorporated into those of the U.S. Energy Research and Development Administration.

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ABSTRACT

Fast neutron total and scattering cross sections of elemental nickel are measured. Differential elastic scattering cross sections are determined from incident energies of 0.3 to 4.0 MeV. The cross sections for the inelastic neutron excitation of states at: 1.156±0.015, 1.324±0.015, 1.443±0.015, 2.136±0.013, 2.255±0.030, 2.449±0.030, 2.614±0.020 and 2.791±0.025 MeV are measured to incident neutron energies of 4.0 MeV. The total neutron cross sections are determined from 0.25 to 5.0 MeV. The experimental results are discussed in the context of optical and statistical models. It is shown that resonance width-fluctuation and correlation effects are significant. The present experimental and theoretical results, together with previously reported values, are used to construct a comprehensive evaluated elemental data file in the ENDF format. Some comparisons are made with previously reported evaluated files. In addition, some selected reactions which are widely used in dosimetry and other applications are presented as supplemental evaluated isotopic-data files. The numerical quantities are presented in tabular form.

*This work is supported by the U.S. Energy Research and Development Administration.

I. INTRODUCTION

Nickel is widely employed in neutronic applications both in the elemental form and as a ferrous alloy (1). Some of the latter alloys are rich in nickel and particularly resistant to radiation damage. In view of this applied usage, it is curious that the fast neutron cross sections of nickel are not well known. Indeed, only recently has the resonance behavior of the total neutron cross section been reasonably established in the several hundred-keV region (2).

Elemental nickel consists primarily of the two isotopes ^{58}Ni and ^{60}Ni. They are in the region of strong $\ell=0$ strength functions where resonance width-fluctuation and correlation corrections to the Hauser-Feshbach formula should be pronounced (3,4). These corrections are important at MeV energies where the excitation of a few discrete levels is a dominant feature of the inelastic scattering process. The width-fluctuation correction enhances the average cross section for reactions in which the entrance-and exit-channel fluctuations are correlated with a corresponding reduction in cross sections for reactions without such correlation. The low-energy excited levels of these isotopes exhibit the characteristics of two-phonon vibrational excitation and channel coupling between the ground and low-energy excited states may be appreciable. It is of interest to compare ellipsoidal-(coupled-channel) and spherical-optical model interpretations of the observed cross sections. Furthermore, the energy-averaged models can be related to the statistical properties of the fluctuating cross sections observed in high-resolution measurements with a consequent improved insight into the nature of the energy-averaged models (5).

Thus, from both basic and applied points of view, the interaction of fast neutrons with nickel is of considerable interest. It is the objective of the present work to examine such processes using experimental and calculational means and to use the results, together with those available from other sources, to construct an evaluated nuclear data file in the ENDF format for applied use (6). The following sections deal with: II) a brief outline of experimental methods, III) a summary of experimental results, IV) an interpretation of the present measured values in the context of optical and coupled-channel models including the statistical nature of the fluctuating structure and the implication of the energy-average models, and V) the formulation of the evaluated data files including a general elemental file and supplemental isotopic files. The complete numerical files are presented in the Appendix.

II. EXPERIMENTAL METHODS

The samples were cylinders of high purity metallic nickel. One set was selected to provide axial neutron transmissions of 50 percent or greater in the total cross section measurements. A second set consisting of 2 cm diameter and 2 cm long right cylinders was used for the scattering measurements with neutrons incident on the lateral surfaces. The samples had negligible chemical impurities.

Throughout the measurements the $^{7}Li(p;n)^{7}Be$ reaction was employed as a neutron source with the metallic-lithium film selected to provide the desired incident neutron energy resolutions.

The total neutron cross sections were deduced from the observed transmissions of approximately monoenergetic neutrons through the samples (7). The data were obtained from three separate sets of experiments distributed over a decade. The first set spanned the energy range 0.25 to 0.65 MeV. It utilized an automated facility and BF_3

neutron detectors (8). The second set of measurements extended from 0.30 to 1.50 MeV. The method was essentially the same as that of the first set with a proton-recoil scintillator replacing the BF_3 detectors. The recoil scintillator was biased to reject the second (minority) neutron group from the source reaction and gamma-ray sensitivity was suppressed with appropriate circuitry. The third set of measurements extended from 1.5 to 5.0 MeV. The method was essentially the same as employed below 1.5 MeV with the addition of time-of-flight techniques to control the background and reduce other experimental perturbations (9). Absolute energy scales were determined relative to the threshold of the neutron-source reaction with an estimated precision of a few keV. Much of the total cross section data was obtained in an energy-random manner which tended to mitigate systematic uncertainties.

The scattering measurements employed time-of-flight techniques using an 8-10 angle detection system (10). The scattered neutron velocity resolutions were in the range 0.4 to 1.0 nsec/m with the better velocity resolution at the higher incident energies. The scattering angles ranged from approximately 20 to 160 deg. At incident energies of $\lesssim$ 1.5 MeV measurements were made at 8 to 10 scattering angles distributed over the angular range. At higher incident neutron energies measurements were made at 16 to 20 scattering angles. The relative energy dependence of the detector efficiencies and the absolute values of the cross sections were measured relative to the H(n,n) process at energies > 1.5 MeV (11) and relative to the C(n,n) process at $\lesssim$ 1.5 MeV (12). All measured scattering cross sections were corrected for angular resolution, beam attenuation and multiple collision effects using Monte-Carlo procedures (13). All cross section values reported herein are expressed in units of barns per atom of the element unless otherwise specified. The particular apparatuses and procedures are described in detail elsewhere (8,9,10).

III. EXPERIMENTAL RESULTS[a]

1. Total Neutron Cross Sections

The total neutron cross sections were measured from 0.25 to 5.0 MeV. While the resolution of 2.0 to 2.5 keV was good, it was not in itself a goal. More attention was given to the accuracy of the energy-averaged magnitudes to provide a good foundation for the development of energy-averaged models and to assure accurate normalization of evaluated cross section sets. The statistical accuracies of the individual data points were in the range 1-2 percent and considerable attention was given to the minimization of systematic errors. The results are summarized and compared with the angle-integrated elastic scattering values and with the evaluated total cross section in Fig. 1. Below 1.5 MeV the present values are in good agreement with the white-source results of Perey et al. (2), considering that the latter have appreciably better resolution with correspondingly greater maxima. The present values may tend to have slightly lower minima. The energy scales appear consistent. Above 0.5 MeV the present values are in good agreement with the white-source results of Cierjacks et al. (14). The latter provide better resolution to about 2.0 MeV. At higher energies the resolutions of the present measurements are probably superior, and thus the data fluctuations are larger. The present values confirm, with a different technique, the major features and magnitudes of the two comparable sets of higher resolution white-source results. When broad energy-averages are constructed from these measured data

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a. All measured data reported herein has been transmitted to the National Neutron Cross Section Center, Brookhaven National Laboratory.

sets the agreement is particularly good. In addition, there is a number of more limited monoenergetic data sets that are consistent with the present experimental values (15).

2. Elastic Neutron Scattering Cross Sections

The differential elastic scattering cross sections were measured from 0.3 to 4.0 MeV. Below $\sim$ 1.5 MeV the incident neutron energy resolution was $\sim$ 20 keV and the measurements were made at intervals of $\sim$ 20 keV. The estimated uncertainties were 10 to 15 percent. Above 1.5 MeV cross sections were determined at 100 to 200 keV incident energy intervals with resolutions of 30 to 50 keV and estimated uncertainties of 5 to 10 percent or 3 mb/sr, whichever was larger. Factors contributing to these uncertainties varied from measurement to measurement but were generally: 1) sample counting statistics, < 1 to 5 percent, 2) detector normalization procedures, < 3 to 8 percent, 3) uncertainties in reference standards of 1 percent for H(n,n) and 6 percent for C(n,n), and 4) systematic uncertainties associated with geometrical factors (e.g., scattering angle determination) and multiple event corrections collectively amounting to 1 to 3 percent.

The measured differential elastic angular distributions were least-square fitted with Legendre polynomial series. The fitting procedures were based upon the measured values with the addition of a few 180 deg. theoretically deduced cross sections at higher incident energies in order to assure a well behaved extrapolation beyond the measured angular range. The results of the fitting were generally consistent with "Wick's Limit" (16). The angle-integrated elastic cross sections, obtained from the fitting procedures were believed known to $\lesssim$ 10 percent with the better accuracies corresponding to the higher energies. They were generally consistent with the observed total cross sections, as illustrated in Fig. 1, particularly demonstrating an intermediate fluctuating structure similar to the energy-average behavior of the better-resolution total cross section results.

Energy-dependent structure was very evident in the differential elastic distributions, decreasing in magnitude with increasing energy and approaching a smooth behavior at 4.0 MeV. Below 1.5 MeV, these fluctuations were so pronounced that it was difficult to correlate measurements made with slightly different experimental incident energies and/or resolutions or to compare the present results with those reported elsewhere. Therefore the experimental differential distributions were averaged over incident energy intervals of $\lesssim$ 50 keV. The results are summarized in Fig. 2. Expressed in this form the distributions reasonably portray intermediate structure effects and are more comparable with previously reported results. Some of the latter comparisons are shown in Fig. 3. Below 1.5 MeV the present work is only qualitatively consistent with that of Korzh et al. (17), Cox (18) and Walt and Barschall (19). The differences were attributed to the residual effects of structure in the context of the experimental resolutions of the various measurements. From 1.5 to 4.0 MeV the present results compare reasonably well with those of Holmqvist and Wiedling (20), Tsukada et al. (21) and Mackwe et al. (22). Where there are differences they are usually within the respective experimental uncertainties, often at lower energies and/or correlated with observed structure in the high resolution total cross section. An example of the latter effect is illustrated by the results near 1.8 MeV where there is a pronounced "bump" in the total cross section (See Fig. 1) which corresponds to the energy of an angular distribution measured in the present work which differs from results at slightly lower energies reported in Ref. 20.

3. Inelastic Neutron Scattering Cross Sections

The energies of the inelastically scattered neutrons were determined from measured flight times and flight paths and the known incident energy and verified by the observed excitation of well known inelastic neutron scattering processes in other nuclei (e.g., the 846 keV state in ^{56}Fe). The accuracies of the excitation energies determined in this manner were approximately 10 to 30 keV. The present results are compared with previously reported values for ^{58}Ni, ^{60}Ni and ^{62}Ni, as summarized in the Nuclear Data Sheets (23), in Fig. 4. Some of the spectroscopic techniques employed in previous work are capable of determining level energies with greater accuracy than the present measurements and therefore the previously reported excitation values are preferred for the interpretation of Sec. IV and evaluation of Sec. V. Angle-integrated inelastic excitation cross sections were deduced from the measured differential values by least-square fitting a Legendre polynomial series to the observed angular distributions. The estimated accuracies of the resulting cross sections were generally 5 to 15 percent for scattered-neutron energies greater than $\sim$ 0.7 MeV. Lower energy scattered neutrons were routinely observed but the corresponding cross sections were felt to be unreliable due to uncertain detector sensitivities and limited angular information. The cross section results are summarized and compared with previously reported values in Fig. 5.

The observed levels at 1.156±0.015, 1.324±0.015 and 1.443±0.015 MeV were attributed to the first-excited states in ^{62}Ni(1.17 MeV), ^{60}Ni(1.33 MeV), and ^{58}Ni(1.45 MeV), respectively. The cross section magnitudes were in general agreement with those obtained in the direct neutron measurements of Tsukada et al. (21) and Boschung et al. (24), Rodgers et al. (25), Perey et al. (26) and Cranberg and Levin (27). The agreement with a number of results of (n;n',γ) measurements is not as satisfactory; particularly where uncertainties in gamma-ray branching ratios become a contributing factor (28,29,20,31). The fluctuation in the cross section values, particularly in the context of the prominent 1.45 MeV state, was large indicating the presence of an intermediate resonance structure. In such an environment, measurements made with only slightly differing incident energies and/or resolutions can give appreciably different results. Furthermore, the structure evident in the total cross section should be selectively enhanced in the individual inelastic channels and preliminary results of detailed (n;n',γ) studies by D. Smith support this premise (32). Similar structure is well known in similar inelastic processes (e.g., the excitation of the 846 keV state in ^{56}Fe).

The excitation of the 2.136±0.13 and 2.255±0.030 MeV states was primarily attributed to reported levels in ^{60}Ni (2.16 and 2.28 MeV). In addition, there was probably some minor contribution from 2.05, 2.29 and 2.33 MeV states in ^{62}Ni that would not have been resolved from the primary ^{60}Ni contribution in the present experiments. The measured cross section values were generally consistent with previously reported results, particularly those of Tsukada et al. (21).

Observed neutrons corresponding to an excitation of 2.449±0.030 MeV were attributed to contributions from the reported 2.46 and 2.51 MeV states in ^{58}Ni and ^{60}Ni, respectively. The resolutions of the present experiments would not resolve the two components. The measured results are consistent with those reported by Boxchung et al. (24) but possibly somewhat lower than the $(n;n',\gamma)$ values of Ref. 31.

The observed excitations of states at 2.614±0.020 and 2.791±0.030 MeV were well correlated with known levels in ^{60}Ni(2.63 MeV) and ^{58}Ni(2.77 MeV), respectively. The former are in good agreement with the values reported by Perey et al. (26). However, the present cross sections for the excitation of the 2.77 MeV are not consistent with those deduced from the $(n;n',\gamma)$ measurements of Ref. 31 even considering the relatively large uncertainties in the present work.

In addition to the above, neutrons were observed corresponding to the excitation of states above 2.8 MeV. These were not well resolved because of an increasingly complex structure and the cross sections were relatively uncertain. Therefore, these results were not interpreted.

IV. INTERPRETATION AND DISCUSSION

1. The Optical Model and Elastic Scattering

The observed energy-averaged neutron total and elastic scattering cross sections were examined in the context of the optical model (33,34). Parameter selection was based upon comparisons of measured and calculated total and elastic scattering cross sections. The calculated values included compound nucleus contributions determined with the Hauser-Feshbach formula (3) corrected for resonance width fluctuation and correlation effects (4). Over a large portion of the energy range of interest, both total and scattering cross sections fluctuated by large amounts. Therefore, the measured values were averaged over $\sim$ 0.2 MeV energy intervals before making comparisons with calculated results and more emphasis was given to energies above $\sim$ 2.0 MeV where the fluctuations were less pronounced.

An initial attempt to select optical potential parameters from X-square fitting to the observed elastic angular distributions proved unrewarding. The description of individual distributions was generally good but the resulting parameters were sharply dependent upon the incident energy due to the persistence of intermediate fluctuations even in the 0.2 MeV energy average of the measured values. Therefore, the potential was subjectively selected from concurrent comparisons of measured and calculated total and elastic scattering cross sections. Two different potential models were used as starting points for the calculations: 1) that of Moldauer (35), primarily applicable in the lower energy region, and 2) that of Holmqvist and Wiedling (20), more suitable at higher energies regardless of reasonable parameter adjustment. The Holmqvist and Wiedling potential was useful for the extrapolation of various experimental results in the high energy region. Therefore, it was accepted for use in the subsequent computations. The parameter values are given in Table 1. The total cross sections calculated with this potential agree within a few percent with the experimental values at energies above $\sim$ 2.0 MeV as illustrated in Fig. 6. The parameters were not energy dependent and the introduction of such a dependence as suggested, for example, by Engelbrecht and Fiedeldey (36) led to some degradation in the description of experiment. This was probably an artifact of the particular potential and energy range since an energy dependence is a characteristic of broader-scope studies. Below about 2.0 MeV the calculated total cross sections were somewhat larger than the energy-averaged experimental results. This behavior is rather characteristic of this type of potential (relatively large real depth, $\approx$ 50 MeV, and narrow radius) in this mass-energy region. Improved descriptions of total cross sections in this region are obtained using the potentials more of the Moldauer form (relatively smaller real depth, $\approx$ 45 MeV, and larger radius). However, it is an area where large fluctuations make quantitative comparison with an energy-averaged model difficult and where data for applications must be primarily based upon experimental values. Both types of potentials resulted in calculated ℓ=0 strength functions of $\approx 5 \times 10^{-4}$, consistent with the values reported from resonance measurements and systematics (37).

The calculated elastic-scattering cross sections were sensitive to the compound-nucleus contribution throughout the range of the present measurements. This contribution is enhanced by width-fluctuation effects and reduced by resonance correlations. These opposing corrections to the Hauser-Feshbach formula were estimated using the approximations of Moldauer (4) and the computer code NEARREX (38). The results were sensitive to the overlap parameter, Q, which was adjusted to obtain the overall best agreement between measured and calculated elastic and inelastic scattering cross sections. These comparisons indicated a Q of 0.7 to 0.8 as illustrated by the example of Fig. 7. This range is reasonable in the context of the structure evident in the measured quantities (e.g., total cross section). Using Q=0.75 the calculated elastic distributions generally compared well with the measured results of the present work as illustrated in Fig. 3. At the lower energies ($\lesssim$ 1.5 MeV) the fluctuations are large and some differences are to be expected. At higher energies where the fluctuations are smallest, the agreement with the present measured values is good. The model was not explicitly adjusted to describe previously updated elastic scattering results at energies above 4.0 MeV. However, the calculated distributions were representative of measurements as illustrated by the results at 6.0 and 8.0 MeV shown in Fig. 3. More exact parameterization can be obtained at a given energy with detailed adjustment of parameters but at the expense of the overall description. Indeed some specifically tailored parameter sets reported in the literature were found deficient in a broader energy context. Calculated 14 MeV distributions were similar to reported measured values (39,40,41) with discrepancies largely in the details of the diffraction patterns where the experimental results themselves are ambiguous. At these high energies collective vibrational direct-reactions probably contribute to the elastic processes. These were estimated, using a coupled-channel calculation based upon the above potential (42). The inelastic scattering contribution was small at the energies of the present measurements and not a significant factor in the context of elastic scattering (less than uncertainties associated with unknown level structures).

2. The Statistical Model and Inelastic Scattering

The inelastic excitation cross sections were calculated using the above optical potential and the Hauser-Feshbach formula with corrections (3,4). The choice of optical parameters was not explicitly influenced by considerations of inelastic scattering but the selection of the overlap parameter, Q, was made in concert with the considerations of elastic scattering as outlined above. It was assumed that the elemental inelastic scattering was entirely due to ^{58}Ni and ^{60}Ni as more than 94 percent of the element consists of these isotopes. The spectroscopic characteristics of these two isotopes are well known to excitation energies above 3.0 MeV (see Fig. 4) but at higher energies become increasingly uncertain with a corresponding unreliability of the calculated results. The region of uncertainty is generally above the energy range of the present measurements. The calculated results are summarized and compared with the measured values in Fig. 5.

The observed excitation of the 1.17 MeV state was attributed to scattering from ^{62}Ni and not considered in the present calculations. However, the measured values were approximately 15 percent of those calculated for the 1.33 MeV state attributed to ^{60}Ni as expected.

The observed 1.33 and 1.45 MeV states are similar first-excited (2+) levels in ^{60}Ni and ^{58}Ni, respectively. Their calculated excitation functions are similar up to $\approx$ 2.2 MeV then become different as varying channel competition sets in. The results of both calculations are qualitatively similar to the measured values but there are detailed discrepancies (particularly evident in the case of the prominent 1.45 MeV state) which are attributed to the fluctuating structure near thresholds (as noted in Sec. III above). In view of these uncertainties, the calculated results, largely based upon considerations of neutron total and elastic scattering cross sections, were judged acceptable. As expected, the calculated values become increasingly larger than the measured quantities above 4.0 MeV due to omission in the calculations of unknown competing neutron channels.

The observed 2.15 (2+) and 2.28 (0+) MeV states are primarily due to known levels in ^{60}Ni with additional and unresolved small contributions from 2.05, 2.29 and 2.33 MeV levels in ^{62}Ni. The calculated and measured excitation cross sections for the 2.15 MeV state are in good agreement. The calculated results for the excitation of the 2.28 MeV state are smaller than the measured values by an amount consistent with the contribution from the 2.29 and 2.33 MeV states in ^{62}Ni, not included in the calculations. Indeed, the observed angular distribution of scattered neutrons resulting from the 2.28 MeV excitation was anisotropic in the manner characteristic of a 0+ excitation but not to the degree indicated by calculation assuming contribution from a single level. This also would be expected from some additional contributions from ^{62}Ni.

The observed neutrons corresponding to the excitation of a 2.48 MeV state were assumed to be the sum of ^{58}Ni(2.46 MeV,4+) and ^{60}Ni(2.51 MeV,4+) contributions. Calculations based upon this premise gave results consistent with the experimentally observed cross sections of the present experiment to energies of $\gtrsim$ 4.0 MeV. At higher energies the calculated results became increasingly too large, again probably due to the neglect of unknown competing neutron channels.

The measurements did not well define the cross sections for the excitation of the 2.63 MeV and 2.77 MeV states. However, calculated results based upon the premise of contributions from ^{60}Ni(2.63 MeV,3+) and ^{58}Ni(2.77 MeV,2+), respectively, were in reasonable agreement with the experimental values.

The above calculated results were based upon a spherical optical potential and the compound-nucleus model. However, the first excited states of the two prominent even isotopes (^{58}Ni and ^{60}Ni) are attributed to two-phonon vibrational configurations (23,43). Therefore, collective-direct excitations can contribute to the observed scattering processes. This was estimated using coupled-channel calculations assuming a deformation parameter, β_2 = 0.187 and a vibrational coupling of ground

(0+) and first excited (2+) states (44). At the energies of the present measurements the direct contribution was not large as illustrated by the comparison of dashed and dotted curves for the excitation of the 1.45 MeV state shown in Fig. 5. The anisotropy in the scattered neutron angular distributions predicted by the coupled-channel calculations was not recognizable in any of the present measurements and generally of the order of the experimental uncertainties. Moreover, the possible effect is masked by the apparent fluctuations, noted above, and by uncertainties associated with the physical mechanisms involved in the compound nucleus processes. The direct component is a major contribution and clearly evident at incident energies well above those of the present experiments. Examples are found in the cross section magnitudes and angular distributions associated with the excitation of the first (2+) states by 14 MeV incident neutrons as reported by Stelson et al. (45), Clark et al. (46) and Kammerdiener (39). These experimental data at 14 MeV were consistent with the results of the coupled-channel calculations.

All of the above compound-nucleus calculations, for both elastic and inelastic scattering, employed the Hauser-Feshbach formula with the correction factors suggested by Moldauer (4). The latter are recognized as qualitative approximations. However, it is clear that such correction factors appreciably influence the comparisons of calculated and measured values and thus the basic model selection. More definitive model determination will probably require a better understanding of these correction factors. Such is now being sought, for example, by Moldauer (47), Kawai et al. (48) and Weidenmüller (49). Wide application of these new physical concepts will require the development of practical computational tools for experiment analysis.

V. THE EVALUATED FILE

The above experimental and calculational results, together with previously reported information, were utilized to construct a comprehensive evaluated data file in the ENDF/B format (6). The objective was to make available the most recent information in a form suitable for applied use. This evaluation was confined to energies greater than 100 keV. For completeness, the file was extended to lower energies explicitly using the preliminary version of ENDF/B-IV formulated by M. Bhat (6). In addition to the general elemental file, selected isotopic files were formulated where they referred to specific reactions that are often employed on an isotopic basis (e.g., in dosimetry applications). The elemental file was constructed from these isotopic components where appropriate. The derivation of the present file is outlined in the subsequent text and the numerical values are given in the Appendix. Throughout, attention was given to both physical content and conciseness.

1. Total Neutron Cross Sections

From 0.1 to 0.5 MeV the data base for the present evaluation was obtained from Refs. 2,50,51,52 and the present work. Ref. 2 appeared to be of the best quality and the more comprehensive therefore was given the primary emphasis. A large-scale graphical representation of these data was assembled and points selected from the measured values so as to give a clear representation of the results with a good degree of conciseness. This procedure resulted in a very good description of the measured values. Above 0.5 MeV the present evaluation was based primarily upon data from Ref. 14. The general character of the structure and the energy-averaged magnitudes of that work were verified by the present measurements and those reported in Refs. 15,53 and 54. Data from Ref. 55

tended to have a lower average magnitude and was not used. The resolution of the data of Ref. 14 appeared very good, and the energy scale was consistent with the results of isotopic measurements given in Ref. 56. The evaluated file in this higher energy region was derived by the same point selection method outlined above to 6.0 MeV. Above 6.0 MeV the data becomes smooth and the file was constructed from energy-averages of the measured values over intervals of 25 keV or larger.

The results of the present evaluation are compared with those of ENDF/B-IV in Fig. 8. Below energies of approximately 0.7 MeV ENDF/B employs a resonance-parameter description and the results are not directly comparable with the point values of the present work. Above 0.7 MeV the two evaluations are similar, though a careful inspection indicates that the present file gives a slightly improved description of the fluctuating structure with, particularly, higher resonance maxima.

Due to the sharp resonance structure over much of the energy range of the file, error estimates are difficult. Undoubtedly, at some future date improved measurements will result in larger maxima and lower minima as suggested by theoretical statistical calculations (5). However, it is unlikely that the energy-averaged magnitudes of the evaluated file will change by more than 3 to 5 percent and, but for a few lower energy regions, the extrema may not change by more than 20 percent.

2. Elastic Neutron Scattering Cross Sections

The evaluated elastic scattering cross sections were primarily based on data from experiments to $\sim$ 8 MeV and near 14 MeV. Theory was used to extrapolate and interpolate where necessary, particularly from 8 to 14 MeV and 14 to 20 MeV. Below 0.3 MeV, the recent experimental results of Zuhr (57) were given primary emphasis. They are consistent with the results of Ref. 12 and the resolution was sufficient to define intermediate fluctuating structure. From 0.3 to 4.0 MeV primary reliance was placed upon the present experimental work supported by the results of Cox (18), Walt and Barschall (19), Tsukada et al. (21) and Holmqvist and Wiedling (20). Some of these experimental results are compared in Fig. 3. Evaluated differential cross sections at 5.0, 6.0, 8.0 and 14.0 MeV were constructed from the measured values of Perey et al. (26), Boschung et al. (24), Holmqvist and Wiedling (20), Clark and Cross (41), Kammerdiener (39) and Bauer et al. (40). The experimental data base above 5.0 MeV was generally available at slightly different incident energies. Measured values were combined in the evaluation when the incident energies were within ± 10 percent of a given median value. Generally the incident energies were much closer and an effort was made to balance high and low energy results about the mean.

The angle-integrated elastic cross sections were obtained by least-square fitting a Legendre polynomial series to the measured values. The 0 deg. cross section value was constrained to exceed the minimum set by "Wick's Limit" (16), and 180 deg. values deduced from the model of Sec. IV, were introduced to assure a well behaved shape. The same model was slightly "tailored" to give good description of 8.0 and 14.0 MeV experimental results and then used to interpolate between 8.0 and 14.0 MeV and to extrapolate to 20 MeV assuming shape scattering only.

The evaluated angle-integrated elastic cross sections were consistent with other known partial cross sections and the total cross sections up to about 4.0 MeV. Above 4.0 MeV the difference between total cross section, and the elastic cross section and observed partial cross sections defined the continuum inelastic cross section. The final evaluated elastic cross section was determined by subtracting the observed nonelastic cross section from the total cross section. This procedure is necessary to achieve the manadatory internal consistency of the file. Unfortunately, it has the physically consequence of reflecting nearly all the detailed structure of the total cross section to the elastic channel. There is little alternative in the absence of high resolution data in all channels and with the requirement of absolute internal consistency. The final evaluated result is summarized and compared with that of ENDF/B-IV in Fig. 9.

The evaluated angular-distributions of elastically scattered neutrons are expressed as f coefficients where

$$\frac{d\sigma}{d\Omega} = \frac{\sigma}{2\pi} \sum_{\ell=0}^{n} \frac{2\ell+1}{2} f_\ell P_\ell \qquad (1)$$

and P_ℓ are Legendre polynomials expressed in the center of mass system. The coefficients are based upon experimental values extrapolated by theory as outlined above. They satisfy "Wick's Limit" (16). The energy resolutions associated with the angular distributions are $\gtrsim$ 50 keV, i.e., much coarser than those of the angle-integrated cross sections. However, the angular distributions do show intermediate fluctuations as evident in the energy dependence of the distributions shown in Fig. 10. The absence of detailed resonance behavior of the angular distributions may lead to some problems in special applications.

The estimated uncertainties in the evaluated angle-integrated elastic scattering cross sections are 5 to 10% up to 8.0 MeV and near 14.0 MeV, regions where there is experimental information available. The uncertainties may be larger in the regions of theoretical interpolation and extrapolation (i.e., 8.0-14.0 MeV and > 14.0 MeV). The uncertainties in the relative angular distributions are qualitatively of the same magnitudes. The file requires internal consistency, thus there is generally a built-in correlation of total and partial cross section uncertainties.

3. Inelastic Neutron Scattering Cross Sections

The evaluated inelastic scattering cross sections are treated as discrete excitation functions from threshold to energies of 3.628 MeV. At higher excitation energies the inelastic neutron process is attributed to a continuum of states with the emission of both precompound- and compound-nucleus inelastic neutron spectra. These two types of inelastic neutron processes are dealt with in the following subtitles, A and B.

A. Discrete Excitation Cross Sections

The energetics of these contributions are based on the spectroscopic values of Ref. 23 as defined in Table 2. The evaluated cross sections are compared with the underlying data base in Fig. 3. The specific components are as follows:

E_x = 1.172 MeV, ^{62}Ni

The evaluation is based upon the present experimental results and those of Tsukada et al. (21) and of Rogers et al. (30). This experimental information is for incident energies of $\lesssim$ 3.0 MeV. At higher energies the evaluation relies on theoretical extrapolation and analogy with results experimentally determined for the similar first excited (2+) states in ^{58}Ni and ^{60}Ni. The neutron emission is assumed isotropic to 4.0 MeV and then becomes anisotropic as direct reactions become appreciable. The degree of anisotropy is derived from model calculations as discussed below for the 1.33 and 1.45 MeV states. No attention is given to the probable presence of fluctuating structure. The latter assumption is an over simplification but will probably have little impact on most applications of the file. The cross-section uncertainties for the excitation of this state are relatively large, 30-50%, but the absolute-uncertainty magnitudes are small, $\lesssim$ 20 mb.

E_x = 1.333 MeV, ^{60}Ni

The excitation of this state has been observed experimentally to $\approx$ 8.0 MeV and at $\approx$ 14 MeV in both (n;n') and (n;n',γ) measurements. The evaluation relies on experimental values interpolated with theory. The approach to threshold from 2.0 MeV is based upon the results of Rogers et al. (30), Sluchaevskaya (31) and D. Smith (32). Primary emphasis is given to the latter. They are relative values, normalized to neutron scattering results at $\approx$ 2.0 MeV, but are in sufficient detail to give an indication of the appreciable fluctuations that must be present. From 2.0 to 8.0 MeV the evaluation is based upon the experimental values of the present work, those of Boschung et al. (24), Tsukada et al. (21), Rogers et al. (30), Day (28), Scherrer et al. (29), Rodgers et al. (25), Sluchaevskaya (31), and Perey et al. (26). The evaluation is extrapolated above 8 MeV using theory adjusted to be consistent with the $\approx$ 14 MeV experimental values of Kammerdiener (39) and of Stelson et al. (45). The latter two sets of measurements represent the composite excitations of 1.333 (^{60}Ni) and 1.452 (^{58}Ni) states. The present experimental studies, supported by other measured values, indicate that the neutron emission is essentially isotropic below $\lesssim$ 4.0 MeV and this is assumed in the evaluation. Above 4.0 MeV the observed scattered neutron distributions become increasingly anisotropic (see for example the work of Boschung et al. (24), Perey et al. (26), Stelson et al. (45) and Kammerdiener (39)). These experimental distributions were fitted with Legendre polynomial series. The latter were smoothed and interpolated using coupled-channel calculations and then used to provide the angular distributions for the evaluation. Below $\sim$ 5.0 MeV the energy-averaged of the evaluated cross sections were estimated to have an uncertainty of $\lesssim$ 15%. Above 5.0 MeV the estimated error becomes larger, perhaps as much as 30% at 20.0 MeV. Near threshold the evaluation is deficient in describing the resonance fluctuations and one may expect future high resolution measurements to show fluctuations about the energy-averaged values of as much as an order of magnitude.

E_x = 1.454 MeV, ^{58}Ni

This state is the 2+, ^{58}Ni, complement of the similar 1.333 MeV state in ^{60}Ni (see above). The data base consists of the present measurements and those of Tsukada et al. (21), Rodgers et al. (30), Day (28), Scherrer et al. (29), Rogers et al. (25), Sluchaevskaya (31), Boschung et al. (24) and Perey et al. (26). In addition, the composite excitations of the 1.333 and 1.454 MeV states at 14 MeV reported by Stelson et al. (45) and Kammerdiener (39) were considered. An indication of the partially resolved structure below 2.0 MeV was obtained from the relative (n;n',γ) measurements of D. Smith (32). Even above this energy, there is an indication of the persistence of unresolved resonance fluctuations the definition of which is beyond present experimental information. Therefore, the evaluation follows an energy-averaged above $\sim$ 2.0 MeV. The extrapolation to 20.0 MeV and the treatment of emitted neutron angular distributions were identical to that described above for the excitation of the 1.333 MeV state. The estimated error in the energy-average of the evaluation is 15% below 5.0 MeV increasing to as much as 20-30% at 20.0 MeV.

E_X = 2.158 MeV and E_X = 2.286 MeV, ^{60}Ni

The evaluation is a subjective estimate of the energy-averaged behavior of the cross section deduced from the experimental results of the present work, those of Tsukada et al. (21), Day (28) and Sluchaevskaya et al. (31). These experimental results extend to $\sim$ 4.5 MeV. The extrapolation to higher energies is guided by theory and made consistent with the combined excitations of the 2.158 and 2.284 MeV states reported by Perey et al. (26). The estimated uncertainty over the entire energy range is $\sim \pm$ 20%. The neutron emission was assumed to be isotropic for this and all subsequent excitations.

E_X = 2.459 MeV, ^{58}Ni and E_X = 2.506 MeV, ^{60}Ni

There is little experimentally resolved data on the cross sections for the excitation of these two states. In the present work, that of Sluchaevskaya et al. (31) and of Boschung et al. (24) the cross sections are determined as a composite. Perey et al. (26) observed the excitation of the 2.506 MeV and subsequent 2.625 MeV state in ^{60}Ni as a composite. Tsukada et al. (21) have reported the excitation of the isolated 2.459 MeV and 2.506 MeV states at only a few energies. However, the J^{π} values of these excited states in both ^{58}Ni and ^{60}Ni are reasonably well known. Therefore, the present evaluation is based upon the measured cross sections for the composite excitation broken into the two respective components by a ratio factor calculated from the above model. The results are consistent with the available experimental information. The uncertainty in the individual excitation cross sections may be rather large (up to 50%) but the estimated error in the composite is smaller ($\stackrel{\sim}{\sim}$ 20%) and it is the latter uncertainty that will be relevant to most applications.

E_X = 2.625 MeV, ^{60}Ni

The available experimental information is from the present work and that of Scherrer (29). Supporting evidence are the results of Boschung et al. (24) and Perey et al. (26) which include contributions from the 2.506 MeV state. This rather meager experimental information was extrapolated using theory to obtain the evaluated excitation cross section. The result may have a large error (30-50%) but this will be of little note in most applications due to the small magnitude of the cross sections.

E_X = 2.775 MeV, ^{58}Ni

The evaluation is primarily based upon the present experimental results extrapolated with theoretical estimates. The result is very much larger than indicated by the measurements of Ref. 31. The uncertainties in the evaluation may be large (as much as two).

E_X = 2.901, 2.942 and 3.038 MeV, ^{58}Ni

There is very little direct experimental evidence dealing with these states. For this evaluation we rely upon model calculations assuming the above potential and the J^{π} values of Ref. 23. The calculational estimates should be qualitatively valid (± 30%). In view of these uncertainties, we treat the three levels as a single composite state in this evaluation with a mean excitation energy of 2.960 MeV.

E_x = 3.123, 3.184, 3.195, 3.270, 3.316 and 3.392 MeV, ^{60}Ni and the 3.264 and 3.420 MeV, ^{58}Ni

The cross sections for the excitation of the ^{60}Ni components have been reported by Perey et al. (26). Additional measured values are given by Boschung et al. (24). The individual excitation functions have not been resolved. For this evaluation we assume a mean composite excitation energy of 3.270 MeV and use theory for the extrapolation of measured values particularly where associated with the excitation of the 3.264 and 3.420 MeV states in ^{58}Ni. The uncertainties in the resulting evaluated cross sections are estimated to be $\lesssim$ 30%.

E_x = 3.526, 3.531, 3.593 and 3.620 and 3.775 MeV, ^{58}Ni and 3.588, 3.618, 3.670 and 3.732 MeV, ^{60}Ni

The available experimental information is apparently limited to the measured cross sections for the composite excitation of the ^{60}Ni states reported by Perey et al. (20). The present evaluation uses these measured ^{60}Ni values and the theoretically-calculated excitations of the contributing ^{58}Ni states to obtain the excitation cross section of a "state" at an average energy of 3.628 MeV. The primary uncertainty is in the calculation of the ^{58}Ni contribution. The uncertainty in the evaluation is estimated to be $\gtrsim$ 30%.

The cross sections for the excitation of higher energy states in ^{60}Ni are available from the experimental measurements of Perey et al. (26). However, the larger contributions from ^{58}Ni are unknown and uncertainties in J^{π} values make calculations unreliable. Therefore, the present evaluation is confined to discrete excitation functions corresponding to states at energies of $\lesssim$ 3.7 MeV. Higher energy excitations are treated as continuum distributions as described below.

The above discrete inelastic excitation cross sections are compared with a number of those given in ENDF/B-IV in Fig. 11. The sum of discrete inelastic cross sections of the present evaluation is very similar to that of ENDF/B-IV below 5.0 MeV but there are some appreciable differences between specific excitation functions. Generally, the present evaluation tends toward larger discrete inelastic cross sections at very high energies (e.g., 10–20 MeV). This is a physically acceptable representation of direct excitations which is substantiated by experimental observation and by theoretical estimates. These high-energy cross section components will contribute to a harder emission spectrum at high incident energies than indicated by the simple temperature distribution.

B. Continuum Excitation Cross Sections

The evaluated continuum inelastic cross sections extend from the last discrete inelastic threshold (E_x = 3.628 MeV) to 20.0 MeV. The cross section magnitudes are the differences between the evaluated total cross section and the sum of other identified partial cross sections. Thus the continuum component may also include otherwise unidentified partial cross sections. This is unavoidable when file internal consistency is mandatory and all partial components may not be fully known. The uncertainties in the cross section magnitudes are estimated to be $\lesssim$ 30 percent and are, of course, correlated with those of other cross sections.

The neutron emission spectrum was assumed to consist of three components: 1) discrete neutron groups, 2) a temperature distribution due to compound-nucleus decay, and 3) a pre-quilibrium continuum distribution. The first of these is defined in Topic A, above. The second component was described by a Maxwellian temperature distribution (58) defined by

$$N(E) \sim E \exp(-E/T)$$

where (2)

$$T \propto \sqrt{E}.$$

The third, pre-equilibrium, component has been the subject of recent study by Griffin (59), Cline and Blann (60) and others. The process is usually formulated in the context of few-particle statistical models describing the intermediate configurations between the initial transitory particle excitation and the final long-lived compound nucleus. These pre-equilibrium models successfully describe observed emission spectra. However, a large number of uncertain parameters are involved thus making predictions based largely on the models somewhat uncertain and difficult to apply in pragmatic evaluation. As an alternative the present evaluation represents the pre-equilibrium emission with a "hard" temperature distribution. Thus, the full continuum spectrum is given by

$$N(E) \sim A \cdot E \cdot \exp(-E/T_A) + B \cdot E \cdot \exp(-E/T_B) \quad (3)$$

where (A) and (B) refers to compound nucleus and pre-equilibrium contributions, respectively. The choice of parameters is based upon experimental comparisons. The results of Mathur et al. (61), Voiginer et al. (62) and Perey et al. (26) primarily influenced the selection of compound-nucleus (A) parameters. The selection of pre-equilibrium (B) parameters were largely based on comparisons with the experimental results of Seeliger et al. (63) and Kammerdiener (39) and considerations of spectra obtained in sphere transmission "bench mark" experiments at 14 MeV (64). The compound-nucleus temperature (T_A) was assumed to have a $\sqrt{E}$ dependence with the proportionality constant determined from experimental comparisons. The pre-equilibrium temperature (T_B) was assumed constant, a reasonable approximation in view of other uncertainties. The finally selected parameter values were:

	Rel. Magnitude	Temp.(MeV)	
Compound-Nucleus	$A = 5.0$	$T_A = 0.334 \cdot \sqrt{E}$	
			(4)
Pre-equilibrium	$B = 0.075$	$T_B = 7.0$ MeV	

These values are consistent with the available experimental information and with compound-nucleus parameters reported elsewhere (see, for example, Ref. 26).

All of the continuum distributions were step-wise terminated at the inset of the discrete excitation contributions. This physically anomalous behavior is an artifact of the transition between the two types of representation and should not effect most applications.

The evaluation assumes the continuum neutron emission to be isotropic in the laboratory system. This is reasonable in the context of compound-nucleus contributions but a gross approximation of the pre-equilibrium processes. The latter are characteristically peaked forward (e.g., see Kammerdiener, Ref. 39). However, quantitative definition of anisotropy from the presently available experimental and theoretical knowledge of scattering from nickel would be highly speculative and not of appreciable value for many applications.

The present evaluated inelastic cross sections are very different from those of ENDF/B-IV in the higher energy region as illustrated in Fig. 12. The discrepancy is nearly a factor of two at 14 MeV and above. This is primarily due to larger contributions from several partial emission reaction channels in the present estimates. Prominent among these is the (n;n',p+p,n') reaction where the present evaluation is much larger than that of ENDF/B-IV as discussed below. In addition, there are several reaction channels in the present work that were not included in ENDF/B-IV. With a well known total cross section and a reasonably known elastic scattering cross section these various other partial cross sections primarily interact with and reduce the inelastic scattering cross section. As noted below, some of these components are uncertain and may be overestimated in the present evaluation. Consequently, the present evaluated inelastic cross section at energies of $\gtrsim$ 14 MeV may be uncertain by as much as 25-50%. However, this large uncertainty remains much smaller than the discrepancy with the high energy inelastic cross sections of ENDF/B-IV. This difference may have an important effect on high energy applications such as CTR blanket studies.

4. Radiative Neutron Capture

The evaluation is generally based upon the data of Ref. 65 to 72. Below $\sim$ 0.5 MeV the evaluation follows the recent high-resolution results of Le Rigoleur et al. (65). There is a small ($\sim$ 20 keV) energy gap in the Le Rigoleur et al. results near 200 keV which was bridged with a speculative structure following the general data trend. From 0.5 to 1.0 MeV the evaluation follows the energy-average results of Diven et al. (67) and it is extrapolated to higher energies following the measured values of Poenitz (72).

The energy average of the present evaluation is consistent with that of Moxon (66) to 1.0 MeV and reasonably similar to the ENDF/B-IV values from 0.7 to 1.0 MeV. Above 1.0 MeV, the present results tend to be somewhat larger than those of ENDF/B-IV. The structure in the present evaluation at energies below 0.7 MeV is not directly comparable with that of ENDF/B-IV as the present work is based on direct experimental observation and that of ENDF/B apparently on a resonance extrapolation using systematics.

It is remarkable that present experimental knowledge of nickel fast neutron radiative capture is so sparse. This has been recognized and work now in progress at ANL by Poenitz (72) is improving the situation in the particularly uncertain region above several hundred keV. Until these, and similar, new experimental results become available in final form, the present evaluation must be considered tentative with uncertainties of 20 percent or more over much of the energy range. In addition, it is expected that some future high-resolution measurements will show pronouncedly larger fluctuations in the lower energy region ($\lesssim$ 1.0 MeV). This is particularly so as the available experimental information in the structured region may be influenced by scattered-neutron perturbations.

5. <u>(n;X) Reactions</u>

Energetically possible (n;X) reactions in ^{58}Ni, ^{60}Ni and ^{62}Ni are summarized in Table 3. These processes were addressed in the present evaluation. In addition, there are possible contributions from the minority ($\lesssim$ 1% abundant) ^{61}Ni and ^{64}Ni isotopes. Generally, the latter two isotopes were not given consideration. The primary intent was an elemental evaluated file. However, certain of the above processes are commonly employed on an isotopic basis particularly in dosimetry applications. In these instances the present evaluation includes a secondary isotopic evaluated file in addition to the primary elemental file. Both files are given in the ENDF/B format.

Subsequent sections deal with the specific (n;X) reactions in Table 3.

A. The $(n;2n')$ Reaction

The present evaluation considered contributions from the $^{58}Ni(n;2n)$ and $^{60}Ni(n;2n)$ reactions as defined in the subsequent paragraphs. Both of these reactions have relatively higher thresholds than those associated with the few-percent-abundant ^{61}Ni, ^{62}Ni and ^{64}Ni. Therefore, in addition to the major contributions, the evaluation introduces a very small "tail" extending to the lowest threshold; 7.954 MeV (^{61}Ni). The neutron emission spectrum is approximated by a temperature distribution of the form $N(E) \sim E \cdot \exp(-E/T)$ where the energy dependence of the temperature is given by $T = 0.25 \sqrt{E+Q}$. This is a qualitative estimate based upon systematics and represents a somewhat different spectrum than given in ENDF/B-IV.

The isotopic and elemental evaluations are compared with those of ENDF/B-IV in Fig. 14. Over much of the energy range the present evaluation is $\sim$ 15% lower than that of ENDF/B-IV. This is probably not a significant difference. The uncertainties in both evaluations are at least as large as this difference due to the very uncertain knowledge of the $^{60}Ni(n;2n)$ process (see below).

The $^{58}Ni(n;2n')^{57}Ni$ Reaction

This reaction has a $Q = -12.203$ MeV. ^{57}Ni has a half life of 36 hours and decays via electron capture and $\beta+$ emission (73). Most reported measurements have involved counting annihilation gammas and there are no particular problems associated with measurement of the reaction cross section via this technique.

Measurements have been made over the entire range from threshold to 20 MeV with a concentration of values in the range 14-15 MeV. There are obvious discrepancies in several of the data sets. The available data were divided into two categories. One included those sets which appeared reasonably consistent in magnitude and in the energy dependence of the excitation function. In this category are included the data of Prestwood and Bayhurst (74), Paulsen and Liskien (75), Borman et al. (76), Glover and Weigold (77), Rayburn (78), Cross et al. (79), Bramlitt and Fink (80), Barrall et al. (81), Fink and Wen-deh-lu (82), Paul and Clarke (83), Strain and Ross (84) and Temperly (85). The second category consisted of data sets which were examined but rejected because of apparent inconsistencies with data in the first category. Selection and rejection of data sets were subjective and based on consideration of normalization, energy dependence and experimental factors which govern credibility. Included in the second category were the data of Rayburn (86), Jeronymo et al. (87), Preiss and Fink (88), Purser and Titterton (89), Csikai (90) and Csikai and Peto (91). Three data sets (Refs. 74-76) cover essentially the entire range from threshold to 20 MeV. The data of Prestwood and Bayhurst (74) appear consistently high while that of Borman et al. (76) are consistently low when compared with the data of Paulsen and Liskien (75). The data of Paulsen and Liskien was the most influential in this evaluation. The present evaluation is compared with the category one data base in Fig. 15.

The ^{60}Ni(n;2n') Reaction

There is apparently no experimental data available on this reaction. Estimates at 14 MeV based on statistical theory, N-Z systematics, empirical formulae and data from neighboring nuclei are often used and three evaluations of this sort have been reported. L. Jeki (92) gives a value of 359 mb. and Body and Csikai (93) reported a value of 408 mb. at 14 MeV. Pearlstein (94) computed $\sigma_{n,2n'}$ at three energies and for a fission neutron spectrum with the following results:

E_n (eV)	$\sigma_{n,2n}$ (mb)
13.1	156
14.1	295
15.1	409
fission spect.	0.034

We use the values of Pearlstein for 13.1, 14.1 and 15.1 MeV, then assume that $\sigma_{n,2n'} = 600$ mb at 20 MeV. The qualitative rational for this choice is that the (n;2n') cross section for ^{58}Ni is ~ 50% larger at 20 MeV than at 15 MeV and the Q-values differ by only ~ 0.8 MeV.

B. The (n;3n') Reaction

All of the contributing reaction Q-values are negative and of large magnitude (the smallest is ^{64}Ni = -16.501 MeV). Moreover, the reaction thresholds for the prominent isotopes ^{58}Ni and ^{60}Ni are above 20.0 MeV. Therefore this process was not incorporated in the present evaluation.

C. The (n;p) Reaction

The present evaluation constructs the elemental (n;p) cross section from the ^{58}Ni(n;p), ^{60}Ni(n;p) and ^{61}Ni(n;p) components. Two possible additional contributions are the ^{62}Ni(n;p) and ^{64}Ni(n;p) components. Both of the latter were ignored due to small isotopic abundance and lack of experimental data. These omissions should have only a small effect upon the elemental cross sections. The derivation of the isotopic components is discussed in detail in the subsequent paragraphs. The results are graphically summarized and compared with ENDF/B-IV in Fig. 16. The present elemental evaluation is slightly larger than that of ENDF/B-IV ($\tilde{\sim}$ 5%) and does not show as much structure. The uncertainty associated with the evaluation is estimated to be $\lesssim$ 10% or 20 mb, whichever is larger, to energies of 14 MeV. The

The agreement with the prior ENDF/B-IV values is generally consistent with this accuracy estimate excepting those regions where ENDF/B-IV shows considerable structure (see discussion below).

The $^{58}Ni(n;p)^{58}Co$ Reaction

The Q-value of this reaction is +0.395 MeV. Various levels in ^{58}Co are populated. The most commonly discussed of these is the 9.15 hour isomeric state at 0.0249 keV and the ground state which decays via $\beta+$ emission and electron capture to levels in ^{58}Fe up to an excitation of 1.67 MeV (95). The reaction is well suited to study via activation techniques. The evaluation is inclusive of contributions from isomeric and ground states.

This reaction is widely employed in reactor dosimetry (96,97) because of the low "effective" threshold and because of the convenience of gamma counting. Consequently, there is not only a wealth of experimental data available, but also a number of evaluations (e.g., Refs. 96-99). The present evaluation gave primary attention to the experimental values. Because of the volume of data available, it was decided to be more selective than might otherwise be the case. The data selected met the criteria of being reasonably consistent with the average of all data sets. Greater weight was given to data sets which covered a wide energy range and exhibited reasonable energy dependence. The compilation of Liskien and Paulsen was utilized to deduce the general shape of the cross section between 1 and 20 MeV (100). This compilation includes most work through 1967. Between 1967 and the present, there have been several measurements as reported in CINDA (101). The two most significant new data sets are from the work of Paulsen and Widera (99) and from Smith and Meadows (102).

The data sets which most strongly influenced the present evaluation are plotted in Figs. 17 and 18. They are those of Smith and Meadows (102), Paulsen and Widera (99), Meadows and Whalen (103), Debertin and Roesle(104) and Barry (105). Other data sets were either rejected because they deviated too far from the average or were given less weight because they provided no new information or were in marginal agreement with the majority of previous values. This was particularly true for data in the 14–15 MeV region where an inclusion of all available data would not substantially contribute to the evaluation. These omissions were judged to have little effect on the evaluation. A curve was constructed through the selected data sets and the evaluated cross sections were derived from the curve.

For $E_n < 1$ MeV, only the data from Smith and Meadows (102) and from integral reactor measurements shed light on the cross section. The integral data has been distilled and evaluated by McElroy and co-workers (96,97) and leads to $\sim 3 \times 10^{-6}$ barn for $E_n \sim 0.5$ MeV. The integral measurements give no details of the excitation function. McElroy and co-workers have assumed that the $^{58}Ni(n;p)^{58}Co$ cross section is a constant fraction of the total cross section in this region. The data of Smith and Meadows extends down to 0.44 MeV. The two lowest energy points at 0.44 and 0.63 MeV have broad resolution and large errors. However, these data are consistent with an average cross section of $\sim 2.8 \times 10^{-6}$ barn. This is in good agreement with the general trend of the McElroy et al. results in this region so we assume that the cross section is approximately a constant of 2.8×10^{-6} barn for $E_n = 0.1-.65$ MeV. There may be structure in this region but there is not enough information available to determine its nature. From 0.65 MeV to 1 MeV, a smooth curve was drawn through the data of Smith and Meadows. This data indicates a lower "effective" threshold than previously assumed (e.g., see Refs. 96,97).

In the region E_n = 1.0-6.0 MeV, the evaluation was primarily influenced by the data of Paulsen and Widera (99), Smith and Meadows (102), Meadows and Whalen (103) and Barry (105). The data of Temperly in the region 3-3.5 MeV is in reasonable agreement with the primary set in overall magnitude, but does not exhibit a similar energy dependence (85). The same can be said for the data of Gonzalez et al. (106) and Van Loef (107). The data of Nakai et al. is consistent with the primary set, but is of poor resolution and has large errors (108). The data of Konijn and Lauber (109) deserves particular attention because of the influence it apparently had on the evaluation by Bresesti et al. (98) and the ENDF/B-IV evaluation. These data exhibit large fluctuations in the region 2.8-3.8 MeV while the average energy dependence is in reasonable agreement with the present evaluation. Smith and Meadows (102) measured the cross section with better resolution and observed some structure but the fluctuations were not nearly as large as observed by Konijn and Lauber. This discrepancy remains unresolved. We have accepted the data of Smith and Meadows in preference to that of Konijn and Lauber in this evaluation.

From 6-8 MeV, the data of Paulsen and Widera (99), Barry (105), Debertin and Roesle (104) are in reasonable agreement and adequately define the cross section. The data of Barry seems consistently higher than that of Paulsen and Widera, but the results agree within the stated error limits. The region from 8-13 MeV is devoid of data, so we have estimated the shape of the cross section with a curve which interpolates in a smooth manner.

The magnitude of the cross section and its energy dependence in the region 13-16 MeV is based on the work of Paulsen and Widera (99) and Barry (105). We have taken cognizance of the multitude of data points in the vicinity of 14 MeV. Much of these data consists of single-energy measurements with large error bars. Unfortunately, there are discrepancies of as much as a factor of 10 between several of these data sets. The data of Temperly (85) provide six data points in this region which exhibit a reasonable energy dependence, but otherwise are systematically higher than the data of Paulsen and Widera and of Barry.

For the region 16-20 MeV, only the data of Borman et al. (110,111) and of Jeronymo et al. (87) are available. The data of Jeronymo et al. gives cross sections which appear far too small and were not considered in the evaluation. The data of Borman et al. are considerably higher than that of Paulsen and Widera (99) and Barry (105). We have employed the general energy dependence of the data of Borman et al. in this evaluation, but normalized to the results of Paulsen and Widera and of Barry.

The resultant evaluated curve and the data which most strongly influenced the present evaluation are shown in Figs. 17 and 18.

The $^{60}Ni(n;p)^{60}Co$ Reaction

The $^{60}Ni(n;p)$ reaction produces the active daughter ^{60}Co. The Q-value for this reaction is -2.040 MeV. There are two prominent activities in ^{60}Co. The ground state has a half life of 5.24 years and generates the 1.17 and 1.33 MeV gamma rays familiar to users of gamma-ray detectors. The 58.6 keV excited state of ^{60}Co is an isomer with $T_{1/2}$ = 10.35 min. The isomer cross section ratio σ_m/σ_g is of interest in nuclear structure studies. For most applications (dosimetry, heating and damage) the total cross section is important. This can be measured by waiting for all isomeric activity to die and then measuring the 5.24 year ground state activity.

Measurements have been made of the isomer cross section ratio. Paulsen and Widera (99) obtained a value of 0.53 ± 0.07 barns at E_n = 8.19 MeV and 0.52 ± 0.06 barns at 14.0 MeV. A measurement by Prasad and Sarkar (121) yields a value of 0.025 ± 0.006 barns for the 10.35 min isomer excitation cross section at E_n = 14.8 MeV. Assuming an isomer ratio of ∿ 0.5 it would seem that this value is too small by more than a factor of two.

Measurements by Allan (116,120) and March and Morton (118) were made using photographic emulsions. The emulsion measurements for E_n ∿ 14 MeV indicate that protons from the (n;p) reaction correspond to a nuclear temperature of ∿ 1 MeV.

Experimental measurements define the cross section reasonably well in the energy region E_n = 5.6–19 MeV. At lower energies (E_n = 2–5.6 MeV), there is a conspicuous absence of microscopic data.

We have relied on the evaluation of Simon and McElroy for E_n = 2–7 MeV (97). The lower-energy cross sections were deduced by unfolding activation data from various reactor spectra. Their evaluation agrees well with some of the microscopic data available at E_n = 5.67 MeV. Data from Liskien and Paulsen (112,113,114,115) cover the energy range E_n = 5.6–19 MeV quite thoroughly. We have relied heavily on these data since no other measurements cover as wide an energy range. The available data base indicated an "S-shape" structure in the region 10–12 MeV. No physical justification for such a "bump–dip" could be identified, therefore, the present evaluation assumes a smooth energy dependence rather similar to the maximum in the $^{58}Ni(n,p)^{58}Co$ reaction. The maximum spread of the measured values from the evaluation in this region is $\lesssim$ 2 standard deviations. The usual array of ∿ 14 MeV single data points is available. The data from Allan (116), Levkovskij et al. (117), March and Morton (118) and Storey et al. (119) are in reasonable agreement with the work of Liskien and Paulsen. Measurements at ∿ 14 MeV by Allan (120) and Cross et al. (79) yielded values which appear too large.

The present evaluation is compared with prominent data sets in Fig. 19.

The $^{61}Ni(n;p)^{61}Co$ Reaction

This reaction produces ^{61}Co which has a 1.65-hour half life and emits β- and γ-rays. Measurements of this cross section should not be particularly forbidding except for the low abundance of ^{61}Ni in natural nickel. In any event, the experimental data are limited.

Van Loef (107) has measured the (n,p) cross section at 3.3 ± 0.2 MeV and obtained the value 3 ± 1.5 mb. There are various fission spectrum and pile measurements which were not used in this evaluation. The only remaining data are at $E_n \approx$ 14 MeV. All of these measurements are via activation. Blosser and Handley (122) report σ_{np} = 91 mb at 14 MeV. Cross et al. reported a value of 103 ± 10 mb at 14.5 MeV (79) and later at 14 MeV measured a value of 83 mb (123). Levkovskij et al. report a value of 98 ± 10 mb for E_n = 15 MeV (117). Valter et al. (124) report a value of 86 mb at 14 MeV. These data are insufficient to define the shape of the (n;p) excitation function. However, we note that the Q value of this reaction is -0.5 MeV and differs by only ∿ 0.9 MeV from the

Q-value for $^{58}Ni(n;p)^{58}Co$. Neglecting matters such as competition from other decay channels, we constructed and "evaluated" cross section curve which is qualitatively like the $^{58}Ni(n;p)$ curve but normalized to pass through the Van Loef point at 3.3 MeV and the available 14 MeV data. We accepted the suggested value of 88 mb for 14 MeV given by Pai et al. (125) in generating this curve. The evaluated cross section is shown the curve in Fig. 20.

The $^{62}Ni(n;p)^{62}Co$ Reaction

The $^{62}Ni(n;p)$ reaction leads to ^{62}Co which has a 13.9 min. ground state half life. There is also a 1.51 min. isomer. The only available information on the (n;p) cross section is at $E_n \sim 14$ MeV where there are several measured values. The activation measurements are by Levkovskij et al. (117) (21 ± 3 mb at 14 MeV), Cross et al. (123,125) (24 ± 6 mb at 15 MeV and 39 mb at 14 MeV) and Valter et al. (124) (22 mb at 14 MeV). The measurements by J. E. Strain (84) (106 mb at 14 MeV) and Preiss and Fink (88) (2.0 ± 0.5 mb) for the 1.51 min. isomer and 3.3 ± 0.02 mb for the 13.9 min. ground state at 14.8 MeV) seem discrepant. We assume a total (n,p) cross section at 14 MeV which is an average of values from Refs. 117, 123,125, namely 26 mb, and reject the values from Refs. 84 and 88. For comparison, we have the theoretical value from Gardner and Rosenblum (126) of 39 mb at 14 MeV which is in reasonable agreement with our choice. Since the fragmentary evidence indicates this reaction is similar to that in other nickel isotopes and the natural abundance is small, the process was not considered in the evaluation.

D. The (n;α) Reaction

All isotopes of nickel can contribute to this process at energies of a few MeV. However, the experimental information is very fragmentary and apparently limited to ^{58}Ni, ^{60}Ni and ^{62}Ni. ^{62}Ni has a low elemental abundance and was ignored in the present evaluation shown in Fig. 21. The cross sections of the present evaluation are 25-50% smaller than those of ENDF-IV and approach threshold in a different manner. Moreover, the present evaluation may be too large if some of the theoretical-systematic estimates given below are correct. These are large discrepancies but can be expected in view of the marginal data base available to both evaluations. The uncertainties are disturbing in view of the wide use of high-nickel alloys in radiation environments giving rise to materials-damage problems.

The $^{58}Ni(n;\alpha)^{55}Fe$ Reaction

This reaction has a Q-value of +2.89 MeV. The product nucleus, ^{55}Fe decays 100% by electron capture to the ground state of ^{55}Mn. There is insufficient energy available to reach any excited states of ^{55}Mn, consequently the 2.4 year half-life decay (73) produces only X-rays. The large positive Q-value and the relatively large number of accessible states in ^{55}Fe virtually insure that the reaction cross section will be significant and the resultant α-particle spectra complex. Therefore, accurate measurements of the reaction cross section, inclusive of all final states in ^{55}Fe are very difficult to make.

In principle, it should be possible to utilize activation and low-energy photon ($E_\gamma \sim 6.5$ keV) detection techniques to measure the electron capture X-rays. Apparently this has not been done. The limited available data for this reaction deal with direct detection of the alpha particles.

Weitman et al. have measured the yield of helium produced by irradiation of natural nickel samples (127). For a fission spectrum most of the helium production is due to the $^{58}Ni(n;\alpha)^{55}Fe$ reaction. Mass spectrographic techniques were used to detect the helium. The objective of the measurement was to study swelling effects. The authors calculated on "effective" microscopic cross section for E_n = 1 MeV of 4.8×10^{-3} barn. No errors are quoted for this result, but it must be kept in mind that this derived value is dependent upon the shape of the cross section excitation function in the region of the fission neutrons and this function is essentially unknown.

Several measurements have been made of the α spectra for 14-15 MeV neutron bombardment of ^{58}Ni. These measurements were not able to distinguish alpha particles from (n;n',α) and (n;p',α) reactions. Slinn and Robson measured the cross section for excitation of the ground state of ^{55}Fe and deduced the value 1.0 ± 0.3 mb at E_n = 15.7 MeV (128). Spira and Robson made similar but more detailed measurements at E_n = 14.6 MeV (129). They deduced a cross section of 1.4 ± 0.4 mb for excitation of the ground state of ^{55}Fe and 4.4 ± 1.0 mb for excitation of the 1.332 + 1.412 MeV excited states of ^{55}Fe. In addition, they estimate a cross section of 7.6 ± 2.0 mb for production of α particles with E_α > 14.5 MeV (corresponding roughly to the excitation of levels in ^{55}Fe up to 3 MeV). In this work, the contributions from higher-energy states were neglected as the authors were explicitly interested in the excitation of discrete low-lying levels in order to study certain aspects of nuclear structure theory. This limitation makes the data of little value for applications.

Seebeck and Borman have made direct-particle detection measurements on the $^{58}Ni(n;\alpha)^{55}Fe$ reaction at 14.0 MeV (130). Their apparatus was designed to have a greater sensitivity to low-energy alpha particles than the measurements described above. Various techniques were employed to discriminate against noise and to reject background. In addition, they measured the cross section for the $^{27}Al(n;\alpha)^{24}Na$ reaction and obtained a value of 0.119 ± 0.010 barn which agrees well with results from activation experiments. For the $^{58}Ni(n;\alpha)^{55}Fe$ reaction, they deduce a cross section of 0.113 ± 0.016 barn after correcting the data for the $^{58}Ni(n;n',\alpha)$ reaction.

The results described above more or less exhaust the available data on the reaction, so we turned to theory for guidance in generating an evaluated curve. Gardner and Yu-Wen Yu conducted a study on the basic trends in (n;α) reaction cross sections for Z = 6 - 30 nuclei (131). Statistical calculations were used to predict the relative (n;α) reaction cross sections for 14.5 MeV neutrons and an empirical equation was developed to predict the absolute cross sections. Comparison was made with measured values wherever possible. No data were available for the $^{58}Ni(n;\alpha)^{55}Fe$ reactions, but the value calculated by these authors is 0.256 barns at 14.5 MeV. Buetner et al. carried out statistical calculations for various threshold-reaction cross sections including the $^{58}Ni(n;\alpha)^{55}Fe$ reaction (132). The excitation function which they generated increases nearly linearly from approximately zero at $\sim$ 5.0 MeV to $\sim$ 0.37 barn at $\sim$ 14 MeV. Between 14-16 MeV the cross section levels off and begins to decrease. The shape of the excitation is similar to that of the $^{59}Co(n;\alpha)^{56}Mn$ reaction for which considerable data are available (100). Such qualitative comparisons are a last resort since they can be so readily influenced by other factors such as Q-value and behavior of other decay-channels from the compound nucleus. The available theoretical information may not be very convincing. However, one fact in common is that these calculations indicate a larger cross section than one deduces from the data of Seebeck and Borman (130).

In making the present evaluation, it was decided to rely on the available data, sparse as they are, in order to deduce the magnitude of the cross section. The data of Weitman et al. provide a point at $\sim$ 1 MeV (127). The cross section may be non-zero at lower energies and possibly even significant for thermal neutrons, but lacking data, we assumed that it decreases linearly to approximately zero below 1 MeV. At 14.0 MeV, we chose the value of 0.113 barn reported by Seebeck and Borman because the agreement of their results for $^{27}Al(n;\alpha)^{24}Na$ with activation values is convincing (130). The shape of the cross section at other energies was estimated by comparison with the results for the $^{59}Co(n;\alpha)^{56}Mn$ reaction, taking qualitatively into account the differences in Q-values (Q= +0.3 MeV for the latter reaction). The $^{58}Ni(n;\alpha)^{55}Fe$ cross section is assumed to reach a maximum in the vicinity of 12 MeV and to decrease at higher energies where the $^{58}Ni(n;2n)$ reaction competes strongly.

Our evaluation is in good agreement with a similar curve generated by Meyer (133) except below 2.0 where our results are biased toward larger values by the data of Weitman et al. (127). Meyer was guided by the statistical calculations of Eriksson (134) at E_n = 5 and 10 MeV in the generation of his evaluated curve. The results are compared with the meager experimental data in Fig. 22.

<u>The $^{60}Ni(n;\alpha)^{57}Fe$ and $(^{60}Ni(n;\alpha,n'+n',\alpha)^{56}Fe)$ Reactions</u>

There is only one experimental measurement available, that of Spira and Robson (129). They measured the 14 MeV cross section for the (n;α) reaction to the ground state of ^{57}Fe and obtained 4.3 ± 2 mb. Including α's with energy E_{α} > 14.5 MeV the cross section was raised to 5.6 ± 2 mb.

Lacking data, we resort to theory and are again faced with a confusing picture. Gardner and Yu (131) have used the statistical model to calculate the (n;α) cross section at 14.5 MeV. They obtain $\sigma_{n\alpha}$ = 90.8 mb. Buetner et al. (132) have performed similar calculations for the (n;α) and (n;n'α) reactions and obtained results rising from threshold to $\sim$ 80 mb at 14-16 MeV. This is reasonably consistent with the Gardner and Yu estimate. However, Schmidt (135) questions the normalization used in the calculations by Buetner et al. and suggests that the calculations may overestimate the cross sections by a fact of ∿ 7. If so, the estimates of Buetner et al. are similar to the single measured value of Spira and Robson (129). There obviously is a large uncertainty in these cross sections. This evaluation accepts the theoretical estimates of Refs. (131) and (132) as they appear to be more consistent with the magnitudes encountered in the ^{58}Ni(n;α) processes. The possible error of nearly an order of magnitude is emphasized. It may amount to as much as $\sim$ 20 mb at 14 MeV in the elemental cross section.

The ^{62}Ni(n;α)^{59}Fe Reaction

The daughter ^{59}Fe has a 44.6 day half life and two microscopic measurements have been reported. Levkovskij et al. (117) report a value of 17 ± 4 mb at 14.8 MeV while Yu and Gardner (136) report a value of 22 ± 3 mb at 14.1 MeV. Gardner and Yu (131) have also computed the (n;α) cross section at 14 MeV using a semi-empirical formula (prior to measurement) and obtain 20.6 mb in good agreement with experiment. The above indicates that, in view of the isotopic abundance, this cross section will make a negligible contribution to the evaluation and thus it was omitted.

E. The $(n;\alpha,n')$ Reaction

The lowest threshold for this reaction is 6.401 MeV (^{60}Ni). There is some very fragmentary information available as outlined in the discussion of $(n;\alpha)$ processes. The present evaluation includes a $(n;\alpha,n')$ component estimated from the ^{58}Ni component alone as illustrated in Fig. 23. The uncertainties in this estimate may be very large (50 to 100%). The neutron emission spectrum is assumed to be a soft "temperature" distribution of the form used for the (n;2n) process. There is no comparable ENDF/B-IV component.

F. The $(n;p,n')$ and (n;d) Reactions

Thresholds for $(n;n,p'+p,n')$ reactions are all high, above $\sim$ 8.0 MeV. The present evaluation is based entirely upon contributions from ^{58}Ni and ^{60}Ni, estimated as outlined in the subsequent sections. Contributions from the remaining isotopes should be small as the abundance is a few percent or less and the thresholds are generally above $\sim$ 10.0 MeV. The resulting isotopic and elemental evaluated cross sections are outlined and compared with that of ENDF/B-IV in Fig. 24. The present evaluation is much larger than that of ENDF/B-IV and it may still be too small as the very fragmentary information about the ^{60}Ni contribution may have resulted in a small estimate. Measurements which led to the present evaluation may have included erroneous (n;d) contributions. However, this would likely be a small perturbation. Both evaluations are uncertain by rather large amounts, but probably much less than the discrepancy between the present work and that of ENDF/B-IV. The neutron emission spectrum was assumed to be a soft "temperature" distribution of the form used for the $(n;2n')$ process. This is only a very qualitative estimate and gives no consideration to the differences between spectra from the $(n;n',p)$ and $(n;p,n')$ processes.

Such distinctions are not warranted in view of the qualitative nature of the estimate.

The (n;d) reaction was estimated following a method analogous to that described above. It consisted of only ^{58}Ni and ^{60}Ni contributions. The available information is very marginal and the present evaluation, shown in Fig. 25, must be considered little more than qualitative. However, the cross sections are small and should have little effect for most applications. There is no comparable ENDF/B-IV (n;d) file.

The ^{58}Ni(n;n',p+p,n')^{57}Co and ^{58}Ni(n;d)^{57}Co Reactions

The ^{58}Ni(n;d)^{58}Co reaction has a Q-value of -5.962 MeV while the breakup reactions ^{58}Ni(n;n',p+p,n')^{57}Co have a higher Q-value of -8.177 MeV. Weak binding and barrier penetration considerations are responsible for the fact that deuteron emission does not compete strongly with breakup. In all instances, ^{57}Co is the final product nucleus. ^{57}Co decays with a half life of 272 days to ^{57}Fe via electron capture. Consequently, activation techniques can be utilized to measure the cross section $\sigma_{n;n',p+p,n'+d}$. The fraction due to deuteron emission cannot be distinguished from the breakup fraction by this method. There is a source of error in activation measurements if no correction is made for the ^{58}Ni(n;2n)^{57}Ni ($\varepsilon,\beta+$)^{57}Co contributions. This correction is not hard to make.

The distinction between the ^{58}Ni(n;n',p)^{57}Co and ^{58}Ni(n;p,n')^{57}Co reaction is one of reaction dynamics and should really be looked upon as separate exit channels for decay of the compound nucleus ^{59}Ni. The difference in dynamics leads to differences in the neutron and proton energy spectra which may have important consequences in so far as applications are concerned. In the absence of measurements the decay fractions for these channels is determined by compound-nucleus calculations. A few calculations of this nature have been made for 14 MeV neutrons, but the results leave much to be desired.

We first consider the available data from activation studies. The results of Barrall et al. (81), Glover and Weigold (77), Fink and Lu (82), Temperly (85), Cross et al. (79), Cross and Clarke (137) and Bramlitt and Fink (80) are reasonably consistent. The activation data of Purser and Titterton (89) and Jeronymo et al. (87) yield cross sections which are much smaller. With the exception of the data of Jeronymo et al., the above measurements are all in the region 13-15 MeV.

There have been various measurements involving detection of the charged reaction products. Many of these utilized nuclear emulsion techniques. Without exception, the cross sections derived from these measurements are low. Included in this group is the work of Alvar (138), Allan (116,120), Kumabe and Fink (139) and Glover and Purser (140). The data point of Allan (116) was included in the evaluation because it came closest to the activation values. The rest were rejected. Statistical calculation of the (n,d) reaction on ^{58}Ni by Lu and Fink (141) indicates a cross section of 0.01 barn at E_n = 14.4 MeV. Debertin and Roesle measured the deuteron spectrum for this reaction at 22 MeV and deduced a cross section of 0.0235 ± 0.004 barn including contributions from transitions up to ∼ 8 MeV excitation in the final nucleus ^{57}Co (104). Statistical calculations by Buetner et al. (132) indicate a cross section of ∼ 0.006 barn for E_n = 14.1 MeV. This sparse experimental and theoretical evidence is sufficient to conclude that the (n;d) contribution is a small perturbation to the breakup components. Our evaluation is based mostly on qualitative estimates with the results shown in Fig. 26.

Since the (n;d) contribution is small, the activation data is essentially due to the (n;n,p+p,n') components. We selected a value of 0.55 barn at 14.5 MeV as being representative of the experimental data. The data set of Jeronymo et al. (87), while apparently discrepant in normalization, is the only one which covers the energy range 12-20 MeV. A curve was drawn through the data of Jeronymo et al. and then renormalized by a factor of 3.55 so that the curve would pass through the selected 14.5 MeV value of 0.55 barn. The shape of the excitation function near threshold remains a matter of speculation.

The statistical calculations of the (n;n',p) and (n;p,n') contributions by Lu and Fink yielded a value of 2.5 at 14 MeV for the ratio $\sigma_{n,n',p}/\sigma_{n,p,n'}$ (141). The behavior at other energies is unknown. However, the present evaluation approximates this spectrum with a single evaporation distribution following the procedures used for the (n;2n') reaction. In the absence of definitive experimental results this estimate must be considered qualitative. The above evaluation and respective data base are illustrated in Fig. 27.

The ^{60}Ni(n;d)^{59}Co and ^{60}Ni(n;n',p+p,n')^{59}Co Reactions

There is very little information available on these two reactions. Colli and Iori (142) measured the differential cross section for the (n;d) reaction at an angle of 140 deg. (28° opening angle) and E_n = 14 MeV. For the ground state transition they obtain $\frac{d\sigma}{d\Omega}$ = 1.9 (±10%)

mb/sr. The ground state group is strongest, but from the appearance of the deuteron spectrum, there are unresolved levels corresponding to excitations up to ~ 3 MeV. It is estimated that $\frac{d\sigma}{d\Omega}$ for $E_x \lesssim 3$ MeV ($E_d > 4$ MeV) is ~ 4 mb/sr. It is difficult to estimate the integrated cross section of the basis of the limited data. Assuming isotropy we obtain $\sigma_{n,d} \lesssim 50$ mb. There is evidence based on $^{56}Fe(n;d)^{55}Mn$ angular distribution measurements by Colli et al. (143) that the assumption of isotropy is poor since the distributions exhibit the characteristic forward peaking of the direct pickup mechanism. Thus, $\sigma_{nd} \sim 50$ mb is almost certainly an overestimate.

Data on the (n;n',p) reaction have been deduced by peeling off the (n;p) contribution from nuclear emulsion measurements. Chatterjee (144) reviewed the 14 MeV data on (n;p) and (n;p,x) reactions as of 1964. There are apparently no newer results. The values reported by Chatterjee are: $\sigma_{n,np} = 60 \pm 12$ mb (from Allan (120)), ~ 68 mb (from March and Morton (116) and 59 ± 9 mb (from Allan (116)). There is also a 15° differential scattering value of $\frac{d\sigma}{d\Omega}_{n;n'p} \lesssim 25.9 \pm 5.2$ mb (from Colli (145)). Calculations by Buetner et al. (132) of the (n;n',p)cross section for $E_n = 14$–16 MeV show that it increases rapidly from 12 mb at 14 MeV to ~ 120 mb at 16 MeV. If this is true, then the experimental data must be very uncertain in this region.

With the above evidence, evaluation must be a speculative and qualitative. We assume a 14 MeV (n;d) cross section value of 30 mb and the shape of the same reaction in ^{58}Ni, adjusted to the correct threshold. We follow the same procedure for the (n;n',p+p,n') reaction using a 14 MeV normalization of 65 mb. These are rough estimates which may be in error by factors of 2 to 5. However, the effects on application are probably small as the cross sections are not large and the isotopic contribution is small.

G. (n;t) Reaction

The thresholds for this reaction in both the prominent isotopes are above 11.0 MeV. The cross sections should be smaller than those of the (n;d) reaction (already small). Essentially no experimental information is available. Therefore, this process was omitted in the present evaluation.

H. (n;2p) and (n;^{3}He) Reactions

Both of these processes have relatively low thresholds in ^{58}Ni($\sim$ 6.5 MeV). They are experimentally essentially unknown and are probably similar to the (n;d) cross section, (i.e., small). Therefore, they were also omitted.

I. (n;2p,n'), (n;p,2n') and (n;p,α) Reactions

The first two of these have thresholds of $\gtrsim$ 15.0 MeV. The lowest (n;p,α) threshold is $\sim$ 6.5 MeV. Little is known about any of these processes and the cross sections are expected to be small. Therefore, they are not included in the present evaluation.

J. Photon Production

The photon-production evaluated cross sections were a composite of three contributions: 1) from neutron capture, 2) from (n;n',γ) reactions, and 3) and from high (> 4.0 MeV) neutrons as per the following.

Photon Production from Neutron Capture

The spectrum of capture gamma-rays at thermal neutron energy was taken from Ref. 146. The spectrum was assumed not to vary with incident neutron energy. While this assumption is obviously incorrect, no better prescription is known. The gamma-ray multiplicity was assumed to vary with incident neutron energy according to the relationship:

$$M(E_n) = M(Th)*(E_n + Q)/Q \quad ,$$

where $M(E_n)$ is the multiplicity at incident energy E_n, $M(Th)$ is the multiplicity at thermal neutron energy and Q is the Q-value of the reaction.

Photon Production from the (n,n',γ) Reactions for $E_n < 4.$ MeV

As outlined in Section V.3.A, discrete excitation functions are given for $(n;n',\gamma)$ reactions for levels up to 3.628 MeV. Several of the "states" are mixtures or combinations of levels from ^{58}Ni and ^{60}Ni which could not be resolved experimentally. Direct measurements of photon production are reported in Refs. 147,148 and 149. Only Ref. 149 reports data for incident energies less than 4 MeV. The gamma-ray production cross sections from 1 to 4 MeV reported in Ref. 149 presented the data in .25 MeV bins from .75 to 2 MeV and in .5 MeV bins for photon energies $\geq$ 2 MeV. In order to conserve energy between the excitation functions for neutron inelastic scattering and photon production for incident energies less than 4 MeV, level schemes and branching ratios were adopted for ^{58}Ni and ^{60}Ni from data provided in Refs. 23 and 150. Because some levels could not be resolved experimentally the adopted level schemes and disintegration modes are somewhat artificial. The assumed structure data are presented in Figs. 28 and 29 which can be compared with Fig. 4. As a check against the experimental data, the total photon production cross section at the upper end of this energy range (i.e., 4 MeV) was compared with the measured values reported in Ref. 149. It was found that the line spectra obtained as described here agreed within experimental error with the measurement.

Photon Production Cross Sections and Spectra $4.0 \lesssim E_n \lesssim 20$ MeV

The experimental data reported in Refs. 147,148 and 149 are in substantial agreement where they overlap. Since Ref. 149 covered the entire energy range the values for the cross section and spectra are based on the data of that reference. Because of a low energy cut-off at 0.75 MeV, two lower groups were added from 0.25 to 0.5 MeV and from 0.5 to 0.75 MeV with a value of 0.13 barns for the first of these and 0.26 barns for the second.

Comparison with ENDF/B-IV MAT 1190

The main difference between this evaluation and that of MAT 1190 is in the energy range from 1 to 4 MeV incident neutron energy. The ENDF/B-IV data are based on Ref. 149 from 1 to 20 MeV while the data presented here are based on the same reference but from 4 to 20 MeV. The reconciliation of inelastic scattering functions and photon production data from 1 to 4 MeV described above was not done in the ENDF/B evaluation.

VI. CONCLUDING REMARK

The total neutron cross sections of elemental nickel were determined at intervals of a keV from 0.25 to 5.0 MeV. The experimental values confirm the energy-averaged magnitudes of previously reported high resolution measurements at lower energies and give new definition in the few-MeV range. The differential elastic neutron scattering cross sections of nickel were measured from a 300 keV to 4.0 MeV with sufficient resolution to portray intermediate fluctuating structure. The cross sections for the inelastic neutron excitation of eight states to energies of 2.8 MeV were determined for incident neutron energies up to 4.0 MeV. The experimental results were described reasonably well by an optical-statistical model including corrections for resonance width fluctuation and correlation effects in compound-nucleus processes. The latter correction factors were significant and the interpretation was limited by uncertainties in their calculation. Contributions due to direct collective excitations were estimated by calculation and found to be small. They could not be identified in the present experimental results obtained at energies of $\lesssim$ 4.0 MeV.

The present experimental and calculational results together with those reported in the literature, were used to construct a comprehensive evaluated neutronic file in the ENDFformat. This evaluated file extended from 0.1 to 20.0 MeV and was extrapolated to thermal energies using the values previously defined in ENDF/B-IV. The present evaluation and that of ENDF/B-IV are substantively different in certain areas.

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Table 1

Optical Model Parameters[a]

V^b = 50.80 MeV,	R_v^e = 1.198 F,	A_v = 0.66 F
W^c = 9.25 MeV,	R_w^e = 1.204 F	A_w = 0.484 F
V_{so}^d = 8.0 MeV		

a) These parameter values are identical to those of Ref. 20. Their use in the present work involves compound-nucleus corrections as described in the text.

b) Saxon form.

c) Sacon derivative form.

d) Thomas Spin - orbit form.

e) Radii are expressed in form $R=R_i \cdot A^{1/3}$.

Table 2

Excited "Levels" Contributing to Discrete Inelastic Neutron Excitation Cross Sections

Level	E_x(MeV)	E_{th}(MeV)
1	1.172	1.192
2	1.333	1.355
3	1.454	1.479
4	2.158	2.195
5	2.286	2.324
6	2.459	2.500
7	2.506	2.548
8	2.625	2.670
9	2.775	2.822
10	2.960	3.010
11	3.270	3.325
12	3.628	3.669

Table 3

Summary of (n;X) Reaction Thresholds (in MeV)

Reaction	^{58}Ni	^{60}Ni	^{62}Ni
(n;2n')	12.415	11.579	10.770
(n;3n')	22.862	20.731	18.717
(n;p)	0	2.074	4.511
(n;p,n')	8.319	9.692	11.302
(n;d)	6.056	7.430	9.041
(n;t)	11.265	11.703	11.580
(2;2p)	6.071	10.488	14.460
(n;^{3}He)	6.599	9.338	12.375
(n:α)	0	0	0.442
(n;α,n')	6.519	6.401	7.136
(n;2p,n)	14.451	17.186	2.022
(n;p,2n')	19.895	20.329	20.790
(n;p,α)	6.430	9.367	10.502

FIGURE CAPTIONS

Fig. 1 Total and elastic scattering cross sections of elemental nickel. The present experimental total cross sections are indicated by a solid curve (below 1.5 MeV) and circular data points (above 1.5 MeV). The angle-integrated elastic scattering cross sections are indicated by square data points. The dotted line indicates the evaluated total neutron cross section described in Sec. V of the text.
(Neg. No. 116-2359)

Fig. 2 Differential elastic scattering cross sections of elemental nickel. The present experimental results, averaged over 50 keV resolution increments, are indicated by circular data points. The curves indicate the results of fitting Legendre polynomial series to the measured values.
(Neg. No. 116-2360)

Fig. 3 Comparisons of selected differential elastic scattering cross sections of the present work with previously reported values and with the results of model calculations. The present experimental values are indicated by circular data points; those of Ref. 17 by □, Ref. 18 by △, Ref. 19 by +, Ref. 20 by ×, Ref. 21 by ◇, Ref. 22 by ←, Ref. 24 by [illegible] and Ref. 26 by ×. The indicated incident neutron energies are those of the present results (in MeV). Some of the previously reported values may differ in incident energy by 5-10 percent. The results of model calculations described in Sec. IV of the text are indicated by curves.
(Neg. No. 116-2470)

Fig. 4 Excited structure of ^{58}Ni, ^{60}Ni and ^{62}Ni. Previously reported values, as summarized in the Nuclear Data Sheets (23), are shown for each of the isotopes. The results of the present experiments are noted by the boxes at the right of the diagram where the width of the boxes qualitatively indicates the experimental energy definition.
(Neg. No. 116-2164)

Fig. 5 Inelastic neutron excitation cross sections of nickel. The corresponding excitation energies (in MeV) and contributing isotopes are noted. The present experimental results are indicated by solid data points. Other (n;n') and (n;n';γ) experimental results are referenced as follows: △ =21, + = 30, × =24, ◇ =28, ↑ =29, X̄ =25, Z = 31 and Y = 26. The solid curve indicates the evaluation described in Sec. V. of the text. The results of statistical model calculations are noted by the dotted curves and, when inclusive of direct-reaction contributions, by dashed curves.
(Neg. No. 116-2705)

Fig. 6 Comparison of measured and calculated total neutron cross sections of nickel.
(Neg. No. 116-2706)

Fig. 7 Comparison of measured and calculated differential cross sections for the elastic scattering of 3.5 MeV neutrons from nickel. The measured values are indicated by data points. The calculated results are noted by curves obtained using the indicated values of the overlap parameter, Q.
(Neg. No. 116-2707)

Fig. 8 Comparison of the present evaluated nickel total neutron cross sections with those given in ENDF/B-IV.
(Neg. No. 116-2329)

Fig. 9 Comparison of the present evaluated elastic neutron scattering cross sections of nickel with those given in ENDF/B-IV.
(Neg. No. 116-2710)

Fig.10 Evaluated elastic scattering distributions normalized to a constant elastic scattering cross section of one barn.
(Neg. No. 116-2712)

Fig.11 Some comparisons of evaluated discrete inelastic neutron excitation cross sections. The present evaluation is indicated by solid curves and that of ENDF/B-IV by dashed lines.
(Neg. No. 116-2713)

Fig.12 Evaluated inelastic neutron scattering cross sections. The results of the present evaluation are indicated by solid curves. In addition the total inelastic cross section given

by ENDF/B-IV is noted.
(Neg. No. 116-2711)

Fig.13 Comparison of evaluated radiative capture cross sections of nickel.
(Neg. No. 116-2709)

Fig.14 Evaluated (n;2n') cross sections of nickel. The isotopic and "NAT" values are from the present work. The ENDF/B-IV values for the natural element are also indicated.
(Neg. No. 116-2704)

Fig.15 The (n;2n') cross sections of ^{58}Ni. The experimental values are from Refs. 75-84 and the smooth curve is the present isotopic evaluation.
(Neg. No. 116-2191)

Fig.16 Comparison of the present evaluated (n;p) cross sections with those given in ENDF/B-IV.
(Neg. No. 116-2703)

Fig.17 The (n;p) cross sections of ^{58}Ni below 6.0 MeV. The experimental values are discussed in Sec. V of the text and the curve indicates the present evaluation.
(Neg. No. 116-2190)

Fig.18 The (n;p) cross sections of ^{58}Ni over the entire energy range of the evaluation. The experimental points are discussed in Sec. V of the text. The curve indicates the present evaluated results.
(Neg. No. 116-2189)

Fig.19 The (n;p) cross sections of ^{60}Ni. The experimental results are discussed in Sec. V of the text. The curve is the present evaluation.
(Neg. No. 116-2393)

Fig.20 The (n;p) cross sections of ^{61}Ni. The notation is identical to that of Fig. 19.
(Neg. No. 116-2394)

Fig.21 Comparison of the present evaluated (n;α) cross sections with those given in ENDF/B-IV.
(Neg. No. 116-2702)

Fig.22 Measured and evaluated (n;α) cross section of ^{58}Ni.
(Neg. No. 116-2207)

Fig.23 Evaluated (n;n'α+α,n') cross sections of nickel.
(Neg. No. 116-2699)

Fig.24 Comparison of evaluated (n;n',p+p,n') cross sections of nickel.
(Neg. No. 116-2701)

Fig.25 Evaluated (n;d) cross sections of nickel.
(Neg. No. 116-2700)

Fig.26 Evaluated (n,d) cross sections of ^{58}Ni.
(Neg. No. 116-2209)

Fig.27 Measured and evaluated (n;n'p+p,n') cross sections of ^{58}Ni.
(Neg. No. 116-2208)

Fig.28 Level scheme of ^{58}Ni used in the gamma-ray production evaluation.
(Neg. No. 116-7516)

Fig.29 Level scheme of ^{60}Ni used in the gamma-ray production evaluation.
(Neg. No. 116-7517)

APPENDIX

NUMERICAL EVALUATED DATA FILE IN THE ENDF/B FORMAT

```
2.80000+ 4 5.81826+ 1          1          0          0         55 28 1451    1
     + 0 0.0     + 0           0          0         12          0 28 1451    2
28 NI, REFERENCE  ANL/NDM- 11, 1975,                              28 1451    3
AUTHØRS, A. SMITH, J. WHALEN, P. GUENTHER, D. SMITH, R. HØWERTØN  28 1451    4
C  EVALUATIØN NEW FØR ALL ENERGIES ABØVE 0.1 MEV                  28 1451    5
C  BELØW 0.1 MEV EVALUATIØN USES ENDF/B- IV                       28 1451    6
C                                                                 28 1451    7
C                                                                 28 1451    8
C                                                                 28 1451    9
C                                                                 28 1451   10
C                                                                 28 1451   11
C                                                                 28 1451   12
C                                                                 28 1451   13
C                                                                 28 1451   14
                               1        451         69            28 1451   15
                               2        151         64            28 1451   16
                               3          1        845            28 1451   17
                               3          2        843            28 1451   18
                               3          4         22            28 1451   19
                               3         16         11            28 1451   20
                               3         22          6            28 1451   21
                               3         28          6            28 1451   22
                               3         51          7            28 1451   23
                               3         52         12            28 1451   24
                               3         53         12            28 1451   25
                               3         54          8            28 1451   26
                               3         55          8            28 1451   27
                               3         56          8            28 1451   28
                               3         57          8            28 1451   29
                               3         58          7            28 1451   30
                               3         59          8            28 1451   31
                               3         60          8            28 1451   32
                               3         61          7            28 1451   33
                               3         62          7            28 1451   34
                               3         91          8            28 1451   35
                               3        102        221            28 1451   36
                               3        103         37            28 1451   37
                               3        104          7            28 1451   38
                               3        107         14            28 1451   39
                               3        251         23            28 1451   40
                               3        252         23            28 1451   41
                               3        253         23            28 1451   42
                               4          2        197            28 1451   43
                               4         16         10            28 1451   44
                               4         22         10            28 1451   45
                               4         28         10            28 1451   46
                               4         51         37            28 1451   47
                               4         52         37            28 1451   48
                               4         53         37            28 1451   49
                               4         54         10            28 1451   50
                               4         55         10            28 1451   51
                               4         56         10            28 1451   52
                               4         57         10            28 1451   53
                               4         58         10            28 1451   54
                               4         59         10            28 1451   55
                               4         60         10            28 1451   56
                               4         61         10            28 1451   57
                               4         62         10            28 1451   58
                               4         91         10            28 1451   59
```

					5		16		9			28	1451	60
					5		22		8			28	1451	61
					5		28		8			28	1451	62
					5		91		173			28	1451	63
					12		102		4			28	1451	64
					13		3		117			28	1451	65
					14		3		1			28	1451	66
					14		102		1			28	1451	67
					15		3		59			28	1451	68
					15		102		33			28	1451	69
												28	1 0	70
0,00000+	0	0,00000+	0		0		0		0		0	28	0 0	71
2,80000+	4	5,81826+	1		0		0		4		0	28	2151	72
2,60580+	4	6,80800-	1		0		0		1		0	28	2151	73
1,00000-	5	1,00000+	5		1		1		0		0	28	2151	74
0,00000+	0	7,50000-	1		0		0		2		0	28	2151	75
5,74371+	1	0,00000+	0		0		0		18		3	28	2151	76
-2,85000+	4	5,00000-	1	1,18190+	4	1,18170+	4	2.14000+	0	0.00000+	0	28	2151	77
1,55000+	4	5,00000-	1	1.40210+	3	1,40000+	3	2.14000+	0	0,00000+	0	28	2151	78
6.28000+	4	5,00000-	1	3,30210+	3	3.30000+	3	2.14000+	0	0.00000+	0	28	2151	79
5,74371+	1	0,00000+	0		1		0		72		12	28	2151	80
6,69000+	3	5,00000-	1	6,23000-	1	2,30000-	2	6,00000-	1	0,00000+	0	28	2151	81
1.33000+	4	1,50000+	0	8,20000-	1	2,20000-	1	6.00000-	1	0,00000+	0	28	2151	82
1,35000+	4	1,50000+	0	1,06000+	0	4.60000-	1	6.00000-	1	0.00000+	0	28	2151	83
1,90000+	4	1,50000+	0	6,33000-	1	3,30000-	2	6.00000-	1	0.00000+	0	28	2151	84
2,00000+	4	1,50000+	0	7,20000-	1	1.20000-	1	6.00000-	1	0.00000+	0	28	2151	85
2,11000+	4	5,00000-	1	9,00000+	0	8,40000+	0	6.00000-	1	0,00000+	0	28	2151	86
2,16000+	4	1,50000+	0	1,44000+	0	8.40000-	1	6.00000-	1	0.00000+	0	28	2151	87
3,24000+	4	1,50000+	0	3.57000+	0	2,57000+	0	1.00000+	0	0,00000+	0	28	2151	88
3,42000+	4	1,50000+	0	1,31000+	0	7.10000-	1	6.00000-	1	0.00000+	0	28	2151	89
3.61000+	4	1,50000+	0	2,03000+	0	1,43000+	0	6.00000-	1	0.00000+	0	28	2151	90
4,79000+	4	1,50000+	0	4,76000+	0	3,76000+	0	1.00000+	0	0.00000+	0	28	2151	91
5,48000+	4	5,00000-	1	1,29000+	0	6,90000-	1	6.00000-	1	0,00000+	0	28	2151	92
2,80600+	4	2,64700-	1		0		0		1		0	28	2151	93
1.00000-	5	1,00000+	5		1		1		0		0	28	2151	94
0,00000+	0	6,50000-	1		0		0		2		0	28	2151	95
5,94154+	1	0,00000+	0		0		0		36		6	28	2151	96
1,24300+	4	5,00000-	1	2,50210+	3	2,50000+	3	2.14000+	0	0.00000+	0	28	2151	97
2,67000+	4	5,00000-	1	6,52140+	2	6,50000+	2	2.14000+	0	0,00000+	0	28	2151	98
4,30800+	4	5,00000-	1	7,91400+	1	7,70000+	1	2,14000+	0	0,00000+	0	28	2151	99
6,53000+	4	5,00000-	1	3,92430+	2	3,90000+	2	2,43000+	0	0.00000+	0	28	2151	100
8,70000+	4	5,00000-	1	3,12140+	2	3,10000+	2	2,14000+	0	0.00000+	0	28	2151	101
9,66000+	4	5,00000-	1	6,92140+	2	6,90000+	2	2.14000+	0	0,00000+	0	28	2151	102
5,94154+	1	0,00000+	0		1		0		84		14	28	2151	103
1,29200+	3	5,00000-	1	6,01000-	1	1,00000-	3	6.00000-	1	0,00000+	0	28	2151	104
2,25700+	3	1,50000+	0	6,34000-	1	3,40000-	2	6,00000-	1	0,00000+	0	28	2151	105
5,53000+	3	1,50000+	0	6,28000-	1	2,80000-	2	6.00000-	1	0,00000+	0	28	2151	106
2,38000+	4	1,50000+	0	1,90000+	0	7,00000-	1	1,20000+	0	0,00000+	0	28	2151	107
3,01000+	4	1,50000+	0	8,20000-	1	2,20000-	1	6.00000-	1	0,00000+	0	28	2151	108
3,29000+	4	1,50000+	0	8,40000-	1	2.40000-	1	6,00000-	1	0,00000+	0	28	2151	109
3,33000+	4	5,00000-	1	9,00000-	1	3,00000-	1	6.00000-	1	0,00000+	0	28	2151	110
3,94000+	4	1,50000+	0	1,27000+	0	2,70000-	1	1,00000+	0	0.00000+	0	28	2151	111
4,74000+	4	1,50000+	0	1,90000+	0	7.00000-	1	1.20000+	0	0.00000+	0	28	2151	112
4,96000+	4	5,00000-	1	1,05000+	0	4,50000-	1	6,00000-	1	0.00000+	0	28	2151	113
5,15000+	4	1,50000+	0	9,60000-	1	3,60000-	1	6,00000-	1	0,00000+	0	26	2151	114
5,63000+	4	5,00000-	1	1,66000+	0	1,06000+	0	6,00000-	1	0,00000+	0	28	2151	115
5,69000+	4	1,50000+	0	9,20000-	1	3,20000-	1	6,00000-	1	0,00000+	0	28	2151	116
7,13000+	4	1,50000+	0	8,90000-	1	2,90000-	1	6,00000-	1	0.00000+	0	28	2151	117
2,80620+	4	3,97000-	2		0		0		1		0	28	2151	118
1,00000-	5	1,00000+	5		1		1		0		0	28	2151	119

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 0.00000+ 0 6.50000- 1          0          0          2          0 28 2151  1
 6.13958+ 1 0.00000+ 0          0          0         24          4 28 2151  1
 4.60000+ 3 5.00000- 1 1.70210+ 3 1.70000+ 3 2.14000+ 0 0.00000+ 0 28 2151  1
 3.85000+ 4 5.00000- 1 2.52140+ 2 2.50000+ 2 2.14000+ 0 0.00000+ 0 28 2151  1
 5.38000+ 4 5.00000- 1 1.02140+ 2 1.00000+ 2 2.14000+ 0 0.00000+ 0 28 2151  1
 9.35000+ 4 5.00000- 1 2.25210+ 3 2.25000+ 3 2.14000+ 0 0.00000+ 0 28 2151  1
 6.13958+ 1 0.00000+ 0          1          0          6          1 28 2151  1
 7.60000+ 4 5.00000- 1 1.75600+ 2 1.75000+ 2 6.00000- 1 0.00000+ 0 28 2151  1
 2.60640+ 4 1.48000- 2          0          0          1          0 28 2151  1
 1.00000- 5 1.00000+ 5          1          1          0          0 28 2151  1
 0.00000+ 0 7.50000- 1          0          0          2          0 28 2151  1
 6.33782+ 1 0.00000+ 0          0          0         12          2 28 2151  1
 1.38000+ 4 5.00000- 1 8.02140+ 2 8.00000+ 2 2.14000+ 0 0.00000+ 0 28 2151  1
 3.32000+ 4 5.00000- 1 9.52140+ 2 9.50000+ 2 2.14000+ 0 0.00000+ 0 28 2151  1
 6.33782+ 1 0.00000+ 0          1          0          6          1 28 2151  1
 9.52000+ 3 1.50000+ 0 7.16000+ 0 6.18000+ 0 1.00000+ 0 0.00000+ 0 28 2151  1
                                                                  28 2  0  1
 0.00000+ 0 0.00000+ 0          0          0          0          0 28 0  0  1
 2.80000+ 4 5.81826+ 1          0         99          0          0 28 3  1  1
 0.00000+ 0 0.00000+ 0          0          0          3       2526 28 3  1  1
          4          5         36          3       2526          2 28 3  1  1
 1.00000- 5 1.54136+ 2 1.00000- 4 5.40526+ 1 1.00000- 3 2.24026+ 1 28 3  1  1
 1.00000- 2 1.23943+ 1 2.53050- 2 1.06757+ 1 3.36743- 2 1.02879+ 1 28 3  1  1
 4.48205- 2 9.95200+ 0 5.96561- 2 9.66070+ 0 7.94022- 2 9.40820+ 0 28 3  1  1
 1.05684- 1 9.18930+ 0 1.40666- 1 8.99970+ 0 1.67226- 1 8.83510+ 0 28 3  1  1
 2.49198- 1 8.69263+ 0 3.31683- 1 8.56901+ 0 4.41470- 1 8.46184+ 0 28 3  1  1
 5.87596- 1 8.36884+ 0 7.82091- 1 8.28820+ 0 1.04096+ 0 8.21827+ 0 28 3  1  1
 1.38552+ 0 8.15744+ 0 1.84413+ 0 8.10475+ 0 2.45454+ 0 8.05875+ 0 28 3  1  1
 3.26699+ 0 8.01859+ 0 4.34836+ 0 7.98347+ 0 5.78767+ 0 7.95240+ 0 28 3  1  1
 7.70338+ 0 7.92497+ 0 1.02532+ 1 7.90035+ 0 1.36470+ 1 7.87770+ 0 28 3  1  1
 1.81642+ 1 7.85670+ 0 2.41765+ 1 7.83644+ 0 3.21789+ 1 7.81620+ 0 28 3  1  1
 4.28302+ 1 7.79503+ 0 5.70070+ 1 7.77190+ 0 7.58763+ 1 7.74574+ 0 28 3  1  1
 1.00991+ 2 7.71446+ 0 1.22199+ 2 7.69007+ 0 1.62648+ 2 7.64579+ 0 28 3  1  1
 2.16484+ 2 7.58965+ 0 2.88140+ 2 7.51756+ 0 3.83514+ 2 7.42403+ 0 28 3  1  1
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 2.26022+ 3 5.77543+ 0 2.27987+ 3 5.76065+ 0 2.34554+ 3 5.70741+ 0 28 3  1  1
 3.43410+ 3 4.82657+ 0 3.77751+ 3 4.47216+ 0 4.01358+ 3 4.17074+ 0 28 3  1  1
 4.20081+ 3 3.91428+ 0 4.57079+ 3 3.51196+ 0 5.02787+ 3 3.08576+ 0 28 3  1  1
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 6.89046+ 3 1.35281+ 0 6.89068+ 3 1.35297+ 0 6.89100+ 3 1.35559+ 0 28 3  1  1
 6.89147+ 3 1.35486+ 0 6.89216+ 3 1.35498+ 0 6.90005+ 3 1.34975+ 0 28 3  1  1
 8.09744+ 3 4.08794- 1 8.41520+ 3 1.52974- 1 8.61219+ 3-7.50730- 3 28 3  1  1
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8.90718+	3-2.50727-	1	9.27616+	3-6.66960-	1	9.51637+	3-8.67900-	1	28	3	1	180
9.52001+	3-8.91300-	1	9.53692+	3-6.90280-	1	9.55652+	3-9.06040-	1	28	3	1	181
9.79790+	3-1.11070+	0	1.00000+	4-1.27509+	0	1.06447+	4-1.79950+	0	28	3	1	182
1.07777+	4-1.89340+	0	1.11636+	4-2.11620+	0	1.15680+	4-2.25070+	0	28	3	1	183
1.19092+	4-2.33980+	0	1.21950+	4-2.50210+	0	1.32972+	4-3.55180+	0	28	3	1	184
1.32981+	4-3.53900+	0	1.32997+	4-3.52120+	0	1.33013+	4-3.65320+	0	28	3	1	185
1.33019+	4-3.64660+	0	1.33028+	4-3.62920+	0	1.33419+	4-3.62900+	0	28	3	1	186
1.35963+	4-3.75810+	0	1.35975+	4-3.77610+	0	1.35983+	4-3.76960+	0	28	3	1	187
1.35997+	4-3.64570+	0	1.36012+	4-3.83700+	0	1.36017+	4-3.65780+	0	28	3	1	188
1.36025+	4-3.84120+	0	1.36037+	4-3.83590+	0	1.36964+	4-3.88560+	0	28	3	1	189
1.39381+	4-4.19220+	0	1.43964+	4-4.45960+	0	1.44575+	4-4.47290+	0	28	3	1	190
1.46761+	4-4.35390+	0	1.47904+	4-4.13470+	0	1.50000+	4-3.24522+	0	28	3	1	191
1.50169+	4-3.17519+	0	1.51000+	4-2.77279+	0	1.51712+	4-2.42090+	0	28	3	1	192
1.55000+	4-1.55000+	0	1.56908+	4-1.49600+	0	1.58288+	4-1.19600+	0	28	3	1	193
1.59831+	4-6.10000-	1	1.64448+	4 9.36400-	1	1.65425+	4 1.11200+	0	28	3	1	194
1.73315+	4 1.44730+	0	1.73576+	4 1.42340+	0	1.78804+	4 1.26480+	0	28	3	1	195
1.83050+	4 9.40500-	1	1.89968+	4 8.82500-	1	1.89978+	4 8.83600-	1	28	3	1	196
1.89997+	4 8.82390-	1	1.90015+	4 8.70900-	1	1.90022+	4 8.72800-	1	28	3	1	197
1.90102+	4 8.74000-	1	1.97943+	4 6.53400-	1	1.99946+	4 6.10300-	1	28	3	1	198
1.99963+	4 6.13000-	1	1.99975+	4 6.17300-	1	1.99983+	4 6.24600-	1	28	3	1	199
1.99997+	4 6.21390-	1	2.00012+	4 5.75100-	1	2.00017+	4 5.80700-	1	28	3	1	200
2.00025+	4 5.86000-	1	2.00037+	4 5.90600-	1	2.00251+	4 5.94200-	1	28	3	1	201
2.03552+	4 5.19000-	1	2.07868+	4 4.28700-	1	2.09549+	4 4.00200-	1	28	3	1	202
2.10027+	4 3.95300-	1	2.10327+	4 3.97000-	1	2.10542+	4 4.03600-	1	28	3	1	203
2.10688+	4 4.16400-	1	2.10788+	4 4.37000-	1	2.10856+	4 4.68700-	1	28	3	1	204
2.10933+	4 5.39400-	1	2.10954+	4 6.10100-	1	2.10969+	4 5.50800-	1	28	3	1	205
2.10979+	4 5.15900-	1	2.11000+	4 3.95400-	1	2.11021+	4 2.94300-	1	28	3	1	206
2.11031+	4 2.62000-	1	2.11067+	4 2.41200-	1	2.11098+	4 2.60500-	1	28	3	1	207
2.11144+	4 2.78000-	1	2.11212+	4 2.95800-	1	2.11312+	4 3.11400-	1	28	3	1	208
2.11458+	4 3.21800-	1	2.11673+	4 3.27100-	1	2.11988+	4 3.27500-	1	28	3	1	209
2.13132+	4 3.13600-	1	2.26326+	4 9.14000-	2	2.31029+	4 1.58000-	2	28	3	1	210
2.37694+	4-8.99000-	2	2.37791+	4-9.06000-	2	2.37858+	4-9.04000-	2	28	3	1	211
2.37903+	4-8.92000-	2	2.37934+	4-6.70000-	2	2.37955+	4-8.35000-	2	28	3	1	212
2.37969+	4-7.86000-	2	2.37979+	4-6.86000-	2	2.37985+	4-7.20000-	2	28	3	1	213
2.37990+	4-7.54000-	2	2.37997+	4-9.78100-	2	2.38004+	4-1.01400-	1	28	3	1	214
2.38014+	4-1.34100-	1	2.38021+	4-1.15800-	1	2.38030+	4-1.14700-	1	28	3	1	215
2.38045+	4-1.10100-	1	2.38066+	4-1.06700-	1	2.38097+	4-1.04400-	1	28	3	1	216
2.38209+	4-1.03100-	1	2.38306+	4-1.03800-	1	2.38450+	4-1.05600-	1	28	3	1	217
2.50000+	4-3.16169-	1	2.54132+	4-3.98369-	1	2.59780+	4-5.50011-	1	28	3	1	218
2.65768+	4-7.62708-	1	2.65842+	4-7.59564-	1	2.65892+	4-7.52462-	1	28	3	1	219
2.65927+	4-7.39010-	1	2.65950+	4-7.18701-	1	2.65966+	4-7.01270-	1	28	3	1	220
2.65977+	4-6.57380-	1	2.65984+	4-6.50350-	1	2.65989+	4-5.89200-	1	28	3	1	221
2.65997+	4-5.51385-	1	2.66005+	4-6.96900-	1	2.66010+	4-5.44181-	1	28	3	1	222
2.66016+	4-9.91270-	1	2.66023+	4-9.13810-	1	2.66034+	4-8.86100-	1	28	3	1	223
2.66058+	4-8.49538-	1	2.66073+	4-8.32809-	1	2.66108+	4-8.22254-	1	28	3	1	224
2.66158+	4-8.15162-	1	2.66501+	4-8.18210-	1	2.66736+	4-8.27003-	1	28	3	1	225
2.67362+	4-8.58271-	1	2.71628+	4-1.13866+	0	2.76536+	4-1.69450+	0	28	3	1	226
2.79877+	4-2.34405+	0	2.82151+	4-2.86558+	0	2.83699+	4-2.94005+	0	28	3	1	227
2.84753+	4-2.56845+	0	2.85471+	4-2.11391+	0	2.87000+	4-1.56713+	0	28	3	1	228
2.88529+	4-1.36500+	0	2.90301+	4-3.88404-	1	2.91849+	4 2.27826-	1	28	3	1	229
2.94123+	4 5.60171-	1	2.97464+	4 6.31585-	1	2.99030+	4 5.99626-	1	28	3	1	230
3.00939+	4 5.51526-	1	3.00972+	4 5.54177-	1	3.00981+	4 5.55086-	1	28	3	1	231
3.00997+	4 5.51339-	1	3.01013+	4 5.38370-	1	3.01019+	4 5.33886-	1	28	3	1	232
3.01028+	4 5.38680-	1	3.01061+	4 5.40827-	1	3.01090+	4 5.41715-	1	28	3	1	233
3.01132+	4 5.41225-	1	3.08927+	4 3.35265-	1	3.09557+	4 3.20768-	1	28	3	1	234
3.16722+	4 1.74380-	1	3.20174+	4 1.12483-	1	3.21600+	4 8.84870-	2	28	3	1	235
3.22175+	4 7.95900-	2	3.22757+	4 7.19950-	2	3.23154+	4 6.92010-	2	28	3	1	236
3.23424+	4 7.04070-	2	3.23608+	4 7.60250-	2	3.23733+	4 6.65760-	2	28	3	1	237
3.23818+	4 1.03827-	1	3.23676+	4 1.29427-	1	3.23916+	4 1.63182-	1	28	3	1	238
3.23943+	4 2.21820-	1	3.23961+	4 2.80530-	1	3.23973+	4 2.78230-	1	28	3	1	239

3.23983+	4 3,27846-	1	3,23992+	4 3,77400-	1	3.24000+	4 8,11000-	2	28	3	1	240
3.24012+	4-2,01000-	1	3,24026+	4-2,67120-	1	3.24039+	4-1,66090-	1	28	3	1	241
3.24057+	4-1,18140-	1	3,24084+	4-8,23220-	2	3.24124+	4-4,40030-	2	28	3	1	242
3,24182+	4-1,87450-	2	3,24267+	4-2,00900-	3	3.24392+	4 8,23590-	3	28	3	1	243
3,24576+	4 1,39189-	2	3,24846+	4 1,54171-	2	3.24921+	4 1,53170-	2	28	3	1	244
3,25242+	4 1,32179-	2	3,25625+	4 7,42400-	3	3.27181+	4-5,55400-	3	28	3	1	245
3,28720+	4-1,08340-	2	3,28801+	4-1,04350-	2	3.28864+	4-9,93400-	3	28	3	1	246
3,28908+	4-9,05200-	3	3,28937+	4-7,92600-	3	3,28957+	4-6,50500-	3	28	3	1	247
3,28971+	4-3,85400-	3	3,28980+	4-9,01000-	4	3.28997+	4 7,92200-	3	28	3	1	248
3,29013+	4-2,40380-	2	3,29020+	4-2,25070-	2	3,29029+	4-1,88130-	2	28	3	1	249
3.29043+	4-1,67050-	2	3,29063+	4-1,46200-	2	3.29092+	4-1,36500-	2	28	3	1	250
3,29135+	4-1,27340-	2	3,29199+	4-1,21350-	2	3.29767+	4-9,64000-	3	28	3	1	251
3,32000+	4-1,40780-	2	3,32855+	4-2,09490-	2	3,32901+	4-2,06540-	2	28	3	1	252
3,32933+	4-1,98380-	2	3,32954+	4-1,85540-	2	3,32969+	4-1,63180-	2	28	3	1	253
3,32979+	4-1,42630-	2	3,32997+	4-1,90352-	2	3.33014+	4-4,07890-	2	28	3	1	254
3,33021+	4-3,41030-	2	3,33031+	4-3,03730-	2	3,33046+	4-2,86430-	2	28	3	1	255
3,33067+	4-2,73410-	2	3,33099+	4-2,66650-	2	3,33145+	4-2,62650-	2	28	3	1	256
3,34233+	4-2,92960-	2	3,35734+	4-2,52920-	2	3,36819+	4-2,07750-	2	28	3	1	257
3,39079+	4-1,83450-	2	3,41330+	4-2,30290-	2	3,41544+	4-2,22380-	2	28	3	1	258
3,41690+	4-2,04400-	2	3,41789+	4-1,72770-	2	3,41856+	4-1,22090-	2	28	3	1	259
3,41902+	4-4,44900-	3	3,41933+	4 6,52590-	3	3,41955+	4 2,56780-	2	28	3	1	260
3,41969+	4 5,09800-	2	3,41979+	4 7,16500-	2	3,41985+	4 6,27290-	2	28	3	1	261
3,41990+	4 5,37700-	2	3,41997+	4 3,16660-	1	3,42005+	4-2,75500-	1	28	3	1	262
3,42009+	4-2,26243-	1	3,42014+	4-1,77120-	1	3,42021+	4-1,42430-	1	28	3	1	263
3,42031+	4-1,01960-	1	3,42045+	4-8,04950-	2	3,42067+	4-6,71280-	2	28	3	1	264
3,42098+	4-5,51540-	2	3,42144+	4-4,77130-	2	3,42211+	4-4,26070-	2	28	3	1	265
3,42310+	4-3,95380-	2	3,42456+	4-3,78050-	2	3,42670+	4-3,72950-	2	28	3	1	266
3,47277+	4-6,39080-	2	3,57320+	4-1,28915-	1	3,58592+	4-1,36008-	1	28	3	1	267
3,59962+	4-1,41582-	1	3,60294+	4-1,41342-	1	3,60519+	4-1,39431-	1	28	3	1	268
3,60673+	4-1,35552-	1	3,60777+	4-1,29102-	1	3,60848+	4-1,19281-	1	28	3	1	269
3,60897+	4-1,04127-	1	3,60930+	4-8,27670-	2	3,60952+	4-5,82500-	2	28	3	1	270
3,60967+	4-2,53000-	3	3,60978+	4 5,91200-	2	3,60985+	4 9,76200-	2	28	3	1	271
3,60996+	4 1,96384-	1	3,61007+	4-3,25600-	1	3,61015+	4-3,45040-	1	28	3	1	272
3,61022+	4-3,03300-	1	3,61033+	4-2,75080-	1	3.61048+	4-2,54394-	1	28	3	1	273
3,61070+	4-2,19546-	1	3,61103+	4-1,98927-	1	3,61152+	4-1,85134-	1	28	3	1	274
3,61223+	4-1,75414-	1	3,61327+	4-1,69183-	1	3,61481+	4-1,65373-	1	28	3	1	275
3,61706+	4-1,63456-	1	3,62038+	4-1,63168-	1	3,64970+	4-1,76328-	1	28	3	1	276
3,72174+	4-2,13741-	1	3,83724+	4-2,67363-	1	3,93935+	4-3,12053-	1	28	3	1	277
3,93956+	4-3,10105-	1	3,93970+	4-3,08456-	1	3,93980+	4-3,03087-	1	28	3	1	278
3,93985+	4-3,07544-	1	3,93991+	4-3,11980-	1	3,94002+	4-3,29390-	1	28	3	1	279
3,94014+	4-3,29450-	1	3,94020+	4-3,28365-	1	3,94030+	4-3,26547-	1	28	3	1	280
3,94044+	4-3,22861-	1	3,94205+	4-3,16773-	1	4,03842+	4-3,58975-	1	28	3	1	281
4,09283+	4-3,83541-	1	4,12680+	4-4,00140-	1	4,18037+	4-4,31214-	1	28	3	1	282
4,22112+	4-4,65714-	1	4,24886+	4-5,06636-	1	4,26774+	4-5,61349-	1	28	3	1	283
4,28060+	4-6,39408-	1	4,28935+	4-7,52534-	1	4,29530+	4-9,09455-	1	28	3	1	284
4,29936+	4-1,09813+	0	4,30212+	4-1,25883+	0	4,30399+	4-1,30418+	0	28	3	1	285
4,30527+	4-1,22271+	0	4,30614+	4-1,11133+	0	4,30800+	4-9,51876-	1	28	3	1	286
4,30986+	4-8,89608-	1	4,31073+	4-7,73740-	1	4,31388+	4-3,70451-	1	28	3	1	287
4,31664+	4-2,43394-	1	4,32070+	4-2,12976-	1	4,32665+	4-2,38332-	1	28	3	1	288
4,33540+	4-2,82229-	1	4,34826+	4-3,26122-	1	4,36714+	4-3,64312-	1	28	3	1	289
4,39488+	4-3,96957-	1	4,43563+	4-4,26433-	1	4,49549+	4-4,55856-	1	28	3	1	290
4,60023+	4-4,94090-	1	4,73903+	4-5,25853-	1	4,73955+	4-5,17243-	1	28	3	1	291
4,73970+	4-5,10351-	1	4,73979+	4-4,96650-	1	4,73985+	4-5,00446-	1	28	3	1	292
4,73990+	4-5,04230-	1	4,73997+	4-5,34574-	1	4,74004+	4-5,40740-	1	28	3	1	293
4,74014+	4-5,83550-	1	4,74021+	4-5,59130-	1	4,74030+	4-5,57709-	1	28	3	1	294
4,74045+	4-5,51095-	1	4,74142+	4-5,39985-	1	4,74450+	4-5,36845-	1	28	3	1	295
4,77872+	4-5,34107-	1	4,78232+	4-5,28372-	1	4,78477+	4-5,19181-	1	28	3	1	296
4,78644+	4-5,05230-	1	4,78758+	4-4,84623-	1	4,78835+	4-4,54664-	1	28	3	1	297
4,78888+	4-4,11702-	1	4,78924+	4-3,50620-	1	4,78948+	4-2,81990-	1	28	3	1	298
4,78965+	4-2.12280-	1	4,78984+	4-1.97680-	1	4,78989+	4-1,91100-	1	28	3	1	299

4,79000+	4-5,14000-	1	4,79011+	4-7,21600-	1	4.79016+	4-8,37420-	1	28	3	1	300
4,79035+	4-8,41810-	1	4,79052+	4-7,95420-	1	4.79076+	4-7,35450-	1	28	3	1	301
4,79112+	4-6,36686-	1	4,79165+	4-6,46694-	1	4.79242+	4-6.17585-	1	28	3	1	302
4,79356+	4-5,97190-	1	4,79523+	4-5,83421-	1	4.79768+	4-5.74364-	1	28	3	1	303
4.80057+	4-5,65594-	1	4.81434+	4-5,64587-	1	4,95947+	4-5,89082-	1	28	3	1	304
4,95964+	4-5,85527-	1	4,95975+	4-5,82268-	1	4,95983+	4-5,76116-	1	28	3	1	305
4,95997+	4-5,81613-	1	4,96011+	4-6,20865-	1	4,96017+	4-6,21164-	1	28	3	1	306
4,96025+	4-6,13292-	1	4,96036+	4-6.07208-	1	4,96053+	4-6,04206-	1	28	3	1	307
4,96115+	4-6,00329-	1	4,96169+	4-5,99363-	1	5.14951+	4-5,88914-	1	28	3	1	308
5,14967+	4-5,85577-	1	5,14977+	4-5,81071-	1	5,14996+	4-5,65681-	1	28	3	1	309
5,15015+	4-6,22176-	1	5,15023+	4-6,15762-	1	5,15033+	4-6,09738-	1	28	3	1	310
5,15049+	4-6.05467-	1	5,15105+	4-6.00794-	1	5,15155+	4-5,99533-	1	28	3	1	311
5,30367+	4-5,84757-	1	5.34463+	4-5,74452-	1	5,35592+	4-5,66531-	1	28	3	1	312
5,36361+	4-5,55995-	1	5,37241+	4-5,33925-	1	5,37483+	4-5.31701-	1	28	3	1	313
5,37761+	4-5,45018-	1	5,38000+	4-5,56508-	1	5,38240+	4-5,59538-	1	28	3	1	314
5,38759+	4-5,94997-	1	5,39116+	4-6,03299-	1	5,47792+	4-5,80996-	1	28	3	1	315
5,47904+	4-5,71152-	1	5,47934+	4-5,62773-	1	5,47955+	4-5,50116-	1	28	3	1	316
5,47970+	4-5,33680-	1	5,47979+	4-5,10923-	1	5,47985+	4-4,81230-	1	28	3	1	317
5,47990+	4-4,51680-	1	5,47997+	4-5,04733-	1	5.48004+	4-7,97310-	1	28	3	1	318
5,48014+	4-6,85170-	1	5.48021+	4-6.65012-	1	5.48030+	4-6,44247-	1	28	3	1	319
5,48045+	4-6,25890-	1	5,48066+	4-6,15724-	1	5.48142+	4-6,01524-	1	28	3	1	320
5,48306+	4-5,94786-	1	5,50164+	4-5,88571-	1	5,62876+	4-5,74383-	1	28	3	1	321
5,62942+	4-5,65396-	1	5,62961+	4-5,58784-	1	5,62973+	4-5,50754-	1	28	3	1	322
5,62982+	4-5,43185-	1	5,62997+	4-5,57373-	1	5,63012+	4-6,47717-	1	28	3	1	323
5,63018+	4-6,30651-	1	5,63027+	4-6.17671-	1	5,63039+	4-6,07062-	1	28	3	1	324
5,63057+	4-5,99149-	1	5,63084+	4-5,94050-	1	5.63268+	4-5,85924-	1	28	3	1	325
5,68953+	4-5,72660-	1	5,68968+	4-5,68652-	1	5,68978+	4-5,63616-	1	28	3	1	326
5,68997+	4-5,68414-	1	5,69015+	4-6,00914-	1	5,69022+	4-5,97124-	1	28	3	1	327
5,69032+	4-5,91382-	1	5,69047+	4-5,88690-	1	5,69148+	4-5,83143-	1	28	3	1	328
5,91933+	4-5,68070-	1	5,99231+	4-5,53576-	1	6,03448+	4-5,37760-	1	28	3	1	329
6,11287+	4-4,80862-	1	6,16623+	4-4,14266-	1	6.20256+	4-3,61256-	1	28	3	1	330
6,23674+	4-3,15793-	1	6,26000+	4-2,72734-	1	6,33037+	4-2,29043-	1	28	3	1	331
6,39411+	4-1,68420-	1	6,43750+	4-1,22426-	1	6,46703+	4-7,24786-	2	28	3	1	332
6,48714+	4-1,42185-	2	6,50082+	4 3.63075-	2	6,51014+	4 5,26477-	2	28	3	1	333
6,52080+	4-4,01630-	3	6,52552+	4-4,26654-	2	6,53000+	4-5,69638-	2	28	3	1	334
6,53920+	4-6,69390-	2	6,54986+	4-1.70046-	1	6,55918+	4-2,47297-	1	28	3	1	335
6,57286+	4-2,99466-	1	6,59297+	4-3,19408-	1	6.62250+	4-3,21266-	1	28	3	1	336
6,73752+	4-3,18707-	1	6,80984+	4-3,21019-	1	7,05836+	4-3,26154-	1	28	3	1	337
7.12902+	4-3,21871-	1	7.12955+	4-3,17344-	1	7.12969+	4-3,13838-	1	28	3	1	338
7.12979+	4-3,07902-	1	7.12997+	4-3,14743-	1	7.13014+	4-3,49283-	1	28	3	1	339
7.13021+	4-3,42967-	1	7.13031+	4-3,38238-	1	7.13045+	4-3,34145-	1	28	3	1	340
7.13143+	4-3.28468-	1	7.16288+	4-3.25397-	1	7.53919+	4-3,08572-	1	28	3	1	341
7,58694+	4-2,98788-	1	7,59395+	4-3,00126-	1	7.59588+	4-3,02660-	1	28	3	1	342
7,60000+	4-3,10087-	1	7,60889+	4-3.16012-	1	7.70343+	4-3,03110-	1	28	3	1	343
7,95977+	4-2,79878-	1	7,97576+	4-2.78210-	1	8.20436+	4-2,48024-	1	28	3	1	344
8.32579+	4-2.24826-	1	8,38283+	4-2,10443-	1	8,54122+	4-1.36557-	1	28	3	1	345
8,57014+	4-1,07738-	1	8,59191+	4-7,68720-	2	8,62642+	4 6,21000-	3	28	3	1	346
8,64992+	4 1,19282-	1	8,66591+	4 2.55617-	1	8,67679+	4 3,77910-	1	28	3	1	347
8,68420+	4 4,29027-	1	8,68925+	4 3,96350-	1	8,69268+	4 3,30945-	1	28	3	1	348
8,70000+	4 2,23482-	1	8,70732+	4 2,16109-	1	8,71075+	4 1,42156-	1	28	3	1	349
8,72321+	4-1,36507-	1	8,73409+	4-3,03435-	1	8,74765+	4-3,38302-	1	28	3	1	350
8,75008+	4-3,39341-	1	8,77358+	4-3.25367-	1	8,80809+	4-2,91575-	1	28	3	1	351
8,85878+	4-2.51524-	1	8,87642+	4-2,39818-	1	8.94029+	4-2,01838-	1	28	3	1	352
9,04267+	4-1,42516-	1	9,10401+	4-1,02102-	1	9,18804+	4-4,05020-	2	28	3	1	353
9.20339+	4-3,01530-	2	9,27241+	4-1,20440-	2	9.29718+	4-2,38410-	2	28	3	1	354
9,34277+	4-4,16720-	2	9,35000+	4-3,97170-	2	9.40282+	4-2.07720-	2	28	3	1	355
9,42759+	4-3,93950-	2	9,50792+	4-1.28912-	1	9.51745+	4-1,34501-	1	28	3	1	356
9.59735+	4-1.35779-	1	9,59985+	4-1.34730-	1	9.65067+	4-1,00203-	1	28	3	1	357
9,69685+	4-4,28300-	2	9,74694+	4 7,52170-	2	9,75550+	4 9,68090-	2	28	3	1	358
9,78440+	4 2.19528-	1	9,80854+	4 3.53682-	1	9,82497+	4 4.19508-	1	28	3	1	359

9.83615+ 4	3.99957- 1	9.84377+ 4	3.42867- 1	9.86000+ 4	2.45053- 1	28	3	1	360
9.87623+ 4	2.53461- 1	9.88086+ 4	2.17998- 1	9.89503+ 4	3.48410- 2	28	3	1	361
9.90508+ 4	-8.82580- 2	9.91146+ 4	-1.49093- 1	9.93560+ 4	-2.75606- 1	28	3	1	362
9.95111+ 4	-3.05112- 1	9.97106+ 4	-3.16949- 1	1.00000+ 5	-3.00276- 1	28	3	1	363
.10000E 06	.60000E 01	.10100E 06	.58500E 01	.10200E 06	.49500E 01	28	3	1	364
.10370E 06	.39695E 01	.10400E 06	.36200E 01	.10600E 06	.32000E 01	28	3	1	365
.10650E 06	.30700E 01	.10670E 06	.30560E 01	.10700E 06	.30400E 01	28	3	1	366
.10720E 06	.42790E 01	.10870E 06	.13572E 02	.10910E 06	.16050E 02	28	3	1	367
.11000E 06	.17300E 02	.11010E 06	.16080E 02	.11070E 06	.12827E 02	28	3	1	368
.11100E 06	.11200E 02	.11170E 06	.85400E 01	.11200E 06	.74000E 01	28	3	1	369
.11300E 06	.63800E 01	.11400E 06	.58000E 01	.11470E 06	.54850E 01	28	3	1	370
.11570E 06	.50350E 01	.11600E 06	.49000E 01	.11670E 06	.46025E 01	28	3	1	371
.11800E 06	.40500E 01	.12000E 06	.36000E 01	.12020E 06	.35480E 01	28	3	1	372
.12120E 06	.32880E 01	.12200E 06	.30800E 01	.12300E 06	.30900E 01	28	3	1	373
.12320E 06	.32120E 01	.12400E 06	.37000E 01	.12420E 06	.39600E 01	28	3	1	374
.12500E 06	.50000E 01	.12520E 06	.54000E 01	.12550E 06	.60000E 01	28	3	1	375
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.12820E 06	.35680E 01	.13000E 06	.28000E 01	.13020E 06	.27433E 01	28	3	1	377
.13120E 06	.24600E 01	.13300E 06	.19500E 01	.13320E 06	.19500E 01	28	3	1	378
.13500E 06	.19500E 01	.13520E 06	.19920E 01	.13600E 06	.21600E 01	28	3	1	379
.13620E 06	.23240E 01	.13720E 06	.31440E 01	.13800E 06	.38000E 01	28	3	1	380
.13820E 06	.41000E 01	.13970E 06	.63500E 01	.14000E 06	.68000E 01	28	3	1	381
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.14300E 06	.12600E 02	.14350E 06	.11600E 02	.14420E 06	.10480E 02	28	3	1	383
.14500E 06	.92000E 01	.14620E 06	.76400E 01	.14700E 06	.66000E 01	28	3	1	384
.14920E 06	.51333E 01	.15000E 06	.46000E 01	.15020E 06	.44933E 01	28	3	1	385
.15300E 06	.30000E 01	.15320E 06	.28800E 01	.15400E 06	.24000E 01	28	3	1	386
.15500E 06	.22000E 01	.15600E 06	.32000E 01	.15670E 06	.55100E 01	28	3	1	387
.15700E 06	.65000E 01	.15800E 06	.87000E 01	.15870E 06	.92600E 01	28	3	1	388
.15900E 06	.95000E 01	.16000E 06	.94000E 01	.16070E 06	.89800E 01	28	3	1	389
.16200E 06	.82000E 01	.16270E 06	.77800E 01	.16400E 06	.70000E 01	28	3	1	390
.16570E 06	.61500E 01	.16600E 06	.60000E 01	.16770E 06	.53285E 01	28	3	1	391
.16800E 06	.52100E 01	.16900E 06	.52000E 01	.17000E 06	.54800E 01	28	3	1	392
.17100E 06	.57600E 01	.17200E 06	.56000E 01	.17500E [illegible]	.47600E 01	28	3	1	393
.18000E 06	.36000E 01	.18300E 06	.43670E 01	.18380E 06	.27850E 01	28	3	1	394
.18440E 06	.44780E 01	.18650E 06	.32570E 01	.18740E 06	.47680E 01	28	3	1	395
.18660E 06	.36140E 01	.19000E 06	.35533E 01	.19010E 06	.35490E 01	28	3	1	396
.19080E 06	.39520E 01	.19220E 06	.11600E 02	.19260E 06	.11770E 02	28	3	1	397
.19360E 06	.84840E 01	.19510E 06	.40450E 01	.19580E 06	.36060E 01	28	3	1	398
.19670E 06	.40870E 01	.19750E 06	.57060E 01	.19800E 06	.64660E 01	28	3	1	399
.19810E 06	.66160E 01	.19900E 06	.48460E 01	.20280E 06	.23610E 01	28	3	1	400
.20490E 06	.44640E 01	.20500E 06	.47929E 01	.20600E 06	.75823E 01	28	3	1	401
.20650E 06	.94270E 01	.20730E 06	.13510E 02	.20800E 06	.97060E 01	28	3	1	402
.20970E 06	.10320E 02	.21000E 06	.10271E 02	.21160E 06	.10010E 02	28	3	1	403
.21480E 06	.77140E 01	.21560E 06	.83060E 01	.21600E 06	.89224E 01	28	3	1	404
.21650E 06	.96930E 01	.21750E 06	.70220E 01	.21950E 06	.56610E 01	28	3	1	405
.22000E 06	.63652E 01	.22070E 06	.73510E 01	.22160E 06	.52840E 01	28	3	1	406
.22400E 06	.40210E 01	.22500E 06	.34947E 01	.22560E 06	.31790E 01	28	3	1	407
.22830E 06	.15190E 01	.23010E 06	.18420E 01	.23200E 06	.45134E 01	28	3	1	408
.23260E 06	.53570E 01	.23450E 06	.97480E 01	.23650E 06	.93880E 01	28	3	1	409
.24000E 06	.73409E 01	.24080E 06	.68730E 01	.24260E 06	.72850E 01	28	3	1	410
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.24770E 06	.62810E 01	.25100E 06	.44260E 01	.25200E 06	.42722E 01	28	3	1	412
.25470E 06	.38570E 01	.25500E 06	.41976E 01	.25620E 06	.55600E 01	28	3	1	413
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.25870E 06	.65670E 01	.26200E 06	.46970E 01	.26460E 06	.34120E 01	28	3	1	415
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.26720E 06	.16790E 01	.26800E 06	.17050E 01	.26870E 06	.23200E 01	28	3	1	417
.26930E 06	.19690E 01	.27130E 06	.22980E 01	.27200E 06	.38993E 01	28	3	1	418
.27340E 06	.71020E 01	.27440E 06	.82640E 01	.27500E 06	.79165E 01	28	3	1	419

.27560E	06	.75690E	01	.27600E	06	.73279E	01	.27750E	06	.64240E	01	28	3	1	420
.27820E	06	.80890E	01	.27890E	06	.53540E	01	.28080E	06	.21790E	01	28	3	1	421
.28160E	06	.71430E	01	.28290E	06	.94060E	01	.28400E	06	.75939E	01	28	3	1	422
.28410E	06	.74290E	01	.28730E	06	.59510E	01	.28930E	06	.78380E	01	28	3	1	423
.29040E	06	.59370E	01	.29170E	06	.55630E	01	.29200E	06	.55262E	01	28	3	1	424
.29560E	06	.50840E	01	.29600E	06	.50720E	01	.29800E	06	.50120E	01	28	3	1	425
.29840E	06	.50000E	01	.30000E	06	.46116E	01	.30130E	06	.42960E	01	28	3	1	426
.30200E	06	.41075E	01	.30270E	06	.39190E	01	.30400E	06	.22610E	01	28	3	1	427
.30500E	06	.31940E	01	.30580E	06	.64390E	01	.30680E	06	.65980E	01	28	3	1	428
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.31450E	06	.32470E	01	.31500E	06	.32169E	01	.31530E	06	.32020E	01	28	3	1	431
.31720E	06	.49730E	01	.31860E	06	.42650E	01	.32120E	06	.29040E	01	28	3	1	432
.32350E	06	.13270E	01	.32480E	06	.17830E	01	.32610E	06	.56930E	01	28	3	1	433
.32660E	06	.67420E	01	.32770E	06	.75260E	01	.32850E	06	.62560E	01	28	3	1	434
.32900E	06	.76440E	01	.33000E	06	.66613E	01	.33120E	06	.54820E	01	28	3	1	435
.33300E	06	.47570E	01	.33379E	06	.50240E	01	.33460E	06	.74650E	01	28	3	1	436
.33590E	06	.49240E	01	.33710E	06	.36010E	01	.33820E	06	.40160E	01	28	3	1	437
.33940E	06	.48720E	01	.34170E	06	.48390E	01	.34290E	06	.56070E	01	28	3	1	438
.34470E	06	.44300E	01	.34590E	06	.40810E	01	.34600E	06	.39846E	01	28	3	1	439
.34740E	06	.26350E	01	.34860E	06	.26360E	01	.35000E	06	.64260E	01	28	3	1	440
.35390E	06	.51100E	01	.35610E	06	.39220E	01	.35710E	06	.49650E	01	28	3	1	441
.35790E	06	.69110E	01	.35860E	06	.60980E	01	.35960E	06	.81960E	01	28	3	1	442
.36000E	06	.73935E	01	.36120E	06	.49860E	01	.36220E	06	.41620E	01	28	3	1	443
.36450E	06	.42910E	01	.36650E	06	.33730E	01	.36840E	06	.35670E	01	28	3	1	444
.37000E	06	.34842E	01	.37130E	06	.34170E	01	.37200E	06	.32779E	01	28	3	1	445
.37450E	06	.27810E	01	.37550E	06	.24860E	01	.37740E	06	.41520E	01	28	3	1	446
.37850E	06	.53870E	01	.37990E	06	.49870E	01	.38000E	06	.49226E	01	28	3	1	447
.38180E	06	.37640E	01	.38260E	06	.29120E	01	.38400E	06	.43110E	01	28	3	1	448
.38620E	06	.30060E	01	.38790E	06	.31190E	01	.38930E	06	.28460E	01	28	3	1	449
.39110E	06	.34430E	01	.39220E	06	.25200E	01	.39450E	06	.27360E	01	28	3	1	450
.39540E	06	.49240E	01	.39630E	06	.41080E	01	.39740E	06	.55780E	01	28	3	1	451
.39890E	06	.31270E	01	.40000E	06	.28414E	01	.40190E	06	.23480E	01	28	3	1	452
.40580E	06	.19770E	01	.40880E	06	.14360E	01	.41000E	06	.19240E	01	28	3	1	453
.41160E	06	.10940E	01	.41400E	06	.15980E	01	.41620E	06	.37440E	01	28	3	1	454
.41750E	06	.33830E	01	.41910E	06	.46220E	01	.42030E	06	.42330E	01	28	3	1	455
.42160E	06	.17570E	01	.42290E	06	.16690E	01	.42550E	06	.51030E	01	28	3	1	456
.42680E	06	.60710E	01	.42740E	06	.36890E	01	.42780E	06	.31350E	01	28	3	1	457
.42870E	06	.51110E	01	.42940E	06	.62400E	01	.43000E	06	.59202E	01	28	3	1	458
.43070E	06	.55470E	01	.43140E	06	.52640E	01	.43300E	06	.55545E	01	28	3	1	459
.43400E	06	.57360E	01	.43500E	06	.71750E	01	.43640E	06	.64020E	01	28	3	1	460
.43740E	06	.53200E	01	.43840E	06	.63600E	01	.43940E	06	.60760E	01	28	3	1	461
.44010E	06	.52360E	01	.44180E	06	.44280E	01	.44250E	06	.47750E	01	28	3	1	462
.44390E	06	.44810E	01	.44560E	06	.42270E	01	.44770E	06	.42590E	01	28	3	1	463
.44950E	06	.49590E	01	.45000E	06	.48402E	01	.45160E	06	.44600E	01	28	3	1	464
.45270E	06	.30180E	01	.45370E	06	.20470E	01	.45440E	06	.22720E	01	28	3	1	465
.45660E	06	.61240E	01	.45730E	06	.60340E	01	.45840E	06	.51220E	01	28	3	1	466
.45910E	06	.60669E	01	.46060E	06	.45200E	01	.46130E	06	.27550E	01	28	3	1	467
.46210E	06	.33860E	01	.46320E	06	.59900E	01	.46460E	06	.53220E	01	28	3	1	468
.46650E	06	.45680E	01	.46870E	06	.45420E	01	.47020E	06	.35260E	01	28	3	1	469
.47100E	06	.44620E	01	.47210E	06	.44090E	01	.47400E	06	.39690E	01	28	3	1	470
.47630E	06	.52320E	01	.47830E	06	.34920E	01	.47940E	06	.36250E	01	28	3	1	471
.48100E	06	.30560E	01	.48300E	06	.29227E	01	.48490E	06	.27960E	01	28	3	1	472
.48570E	06	.28960E	01	.48730E	06	.42980E	01	.48810E	06	.40890E	01	28	3	1	473
.48970E	06	.29420E	01	.49210E	06	.41480E	01	.49330E	06	.38620E	01	28	3	1	474
.49490E	06	.17190E	01	.49570E	06	.21200E	01	.49660E	06	.48410E	01	28	3	1	475
.49820E	06	.45150E	01	.49900E	06	.49510E	01	.49980E	06	.49820E	01	28	3	1	476
.50010E	06	.42300E	01	.50160E	06	.43400E	01	.50250E	06	.43700E	01	28	3	1	477
.50340E	06	.48600E	01	.50400E	06	.40200E	01	.50540E	06	.30300E	01	28	3	1	478
.50630E	06	.29500E	01	.50720E	06	.31600E	01	.50790E	06	.51900E	01	28	3	1	479

.50820E	06	.54100E	01	.50870E	06	.54700E	01	.50890E	06	.57900E	01	28	3	1	480
.50930E	06	.46900E	01	.50960E	06	.44000E	01	.51000E	06	.45800E	01	28	3	1	481
.51030E	06	.48700E	01	.51080E	06	.50900E	01	.51140E	06	.48900E	01	28	3	1	482
.51170E	06	.46300E	01	.51240E	06	.49500E	01	.51310E	06	.59900E	01	28	3	1	483
.51370E	06	.45700E	01	.51470E	06	.36800E	01	.51490E	06	.35400E	01	28	3	1	484
.51560E	06	.39100E	01	.51600E	06	.45800E	01	.51630E	06	.41600E	01	28	3	1	485
.51690E	06	.37000E	01	.51740E	06	.34200E	01	.51800E	06	.38500E	01	28	3	1	486
.51850E	06	.30500E	01	.51920E	06	.25600E	01	.51980E	06	.24300E	01	28	3	1	487
.52050E	06	.24800E	01	.52140E	06	.25700E	01	.52210E	06	.22200E	01	28	3	1	488
.52250E	06	.23600E	01	.52320E	06	.34500E	01	.52360E	06	.50500E	01	28	3	1	489
.52430E	06	.54000E	01	.52490E	06	.48600E	01	.52540E	06	.40500E	01	28	3	1	490
.52630E	06	.34500E	01	.52690E	06	.34900E	01	.52760E	06	.42500E	01	28	3	1	491
.52780E	06	.47500E	01	.52840E	06	.48700E	01	.52910E	06	.47600E	01	28	3	1	492
.52990E	06	.52100E	01	.53000E	06	.51593E	01	.53130E	06	.45000E	01	28	3	1	493
.53210E	06	.41500E	01	.53300E	06	.39657E	01	.53420E	06	.37200E	01	28	3	1	494
.53660E	06	.34900E	01	.53720E	06	.35300E	01	.53780E	06	.36700E	01	28	3	1	495
.53850E	06	.36900E	01	.53970E	06	.31300E	01	.54020E	06	.25400E	01	28	3	1	496
.54080E	06	.30200E	01	.54120E	06	.39000E	01	.54160E	06	.46000E	01	28	3	1	497
.54250E	06	.39500E	01	.54350E	06	.34900E	01	.54490E	06	.31600E	01	28	3	1	498
.54700E	06	.27300E	01	.54900E	06	.25100E	01	.54980E	06	.24100E	01	28	3	1	499
.55070E	06	.20800E	01	.55130E	06	.21000E	01	.55250E	06	.24800E	01	28	3	1	500
.55310E	06	.30100E	01	.55370E	06	.40400E	01	.55410E	06	.48300E	01	28	3	1	501
.55470E	06	.52000E	01	.55510E	06	.45100E	01	.55590E	06	.34700E	01	28	3	1	502
.55650E	06	.29600E	01	.55730E	06	.24000E	01	.55810E	06	.19700E	01	28	3	1	503
.55870E	06	.19600E	01	.55910E	06	.25400E	01	.55950E	06	.34500E	01	28	3	1	504
.55990E	06	.41400E	01	.56030E	06	.43000E	01	.56090E	06	.31600E	01	28	3	1	505
.56150E	06	.24400E	01	.56280E	06	.18800E	01	.56360E	06	.17300E	01	28	3	1	506
.56460E	06	.17300E	01	.56580E	06	.16800E	01	.56710E	06	.25500E	01	28	3	1	507
.56770E	06	.31100E	01	.56890E	06	.35200E	01	.56950E	06	.38700E	01	28	3	1	508
.57040E	06	.40600E	01	.57250E	06	.44000E	01	.57310E	06	.45900E	01	28	3	1	509
.57370E	06	.46700E	01	.57430E	06	.45500E	01	.57500E	06	.50500E	01	28	3	1	510
.57540E	06	.57500E	01	.57560E	06	.59100E	01	.57600E	06	.51700E	01	28	3	1	511
.57670E	06	.45800E	01	.57700E	06	.43850E	01	.57730E	06	.41900E	01	28	3	1	512
.57790E	06	.41000E	01	.57840E	06	.41800E	01	.57900E	06	.36700E	01	28	3	1	513
.58010E	06	.32200E	01	.58070E	06	.30100E	01	.58130E	06	.30700E	01	28	3	1	514
.58220E	06	.35100E	01	.58310E	06	.30200E	01	.58390E	06	.25200E	01	28	3	1	515
.58460E	06	.25900E	01	.58500E	06	.26600E	01	.58560E	06	.22900E	01	28	3	1	516
.58610E	06	.19000E	01	.58670E	06	.19800E	01	.58740E	06	.22600E	01	28	3	1	517
.58800E	06	.19300E	01	.58870E	06	.23900E	01	.58930E	06	.33800E	01	28	3	1	518
.59000E	06	.40900E	01	.59040E	06	.41500E	01	.59110E	06	.34200E	01	28	3	1	519
.59150E	06	.35800E	01	.59240E	06	.26100E	01	.59330E	06	.21100E	01	28	3	1	520
.59420E	06	.18700E	01	.59460E	06	.18200E	01	.59530E	06	.20600E	01	28	3	1	521
.59550E	06	.21100E	01	.59590E	06	.21800E	01	.59660E	06	.21200E	01	28	3	1	522
.59730E	06	.19000E	01	.59790E	06	.13300E	01	.59880E	06	.14600E	01	28	3	1	523
.60000E	06	.18900E	01	.60060E	06	.25700E	01	.60110E	06	.33900E	01	28	3	1	524
.60130E	06	.36000E	01	.60180E	06	.31800E	01	.60220E	06	.30600E	01	28	3	1	525
.60310E	06	.39000E	01	.60380E	06	.49500E	01	.60420E	06	.52200E	01	28	3	1	526
.60510E	06	.42900E	01	.60560E	06	.41500E	01	.60610E	06	.46800E	01	28	3	1	527
.60650E	06	.52900E	01	.60700E	06	.54600E	01	.60720E	06	.59100E	01	28	3	1	528
.60770E	06	.54100E	01	.60810E	06	.51400E	01	.60860E	06	.52200E	01	28	3	1	529
.60900E	06	.55700E	01	.60930E	06	.58000E	01	.60970E	06	.54800E	01	28	3	1	530
.61060E	06	.59900E	01	.61160E	06	.50100E	01	.61340E	06	.39800E	01	28	3	1	531
.61480E	06	.33000E	01	.61600E	06	.31900E	01	.61780E	06	.33200E	01	28	3	1	532
.61880E	06	.37100E	01	.61970E	06	.42700E	01	.62070E	06	.46700E	01	28	3	1	533
.62110E	06	.46400E	01	.62180E	06	.40700E	01	.62250E	06	.31600E	01	28	3	1	534
.62330E	06	.29400E	01	.62420E	06	.32000E	01	.62490E	06	.35000E	01	28	3	1	535
.62540E	06	.34300E	01	.62590E	06	.36800E	01	.62640E	06	.48400E	01	28	3	1	536
.62680E	06	.54200E	01	.62780E	06	.39800E	01	.62850E	06	.31200E	01	28	3	1	537
.62900E	06	.27771E	01	.62920E	06	.26400E	01	.63000E	06	.23600E	01	28	3	1	538
.63070E	06	.29700E	01	.63120E	06	.34100E	01	.63190E	06	.41600E	01	28	3	1	539

.63210E	06	.44100E	01	.63290E	06	.39500E	01	.63340E	06	.32300E	01	28 3	1	540
.63360E	06	.26800E	01	.63430E	06	.29800E	01	.63480E	06	.32000E	01	28 3	1	541
.63530E	06	.34800E	01	.63580E	06	.30800E	01	.63660E	06	.32300E	01	28 3	1	542
.63750E	06	.31000E	01	.63820E	06	.37900E	01	.63950E	06	.49800E	01	28 3	1	543
.64000E	06	.52600E	01	.64050E	06	.49300E	01	.64170E	06	.46700E	01	28 3	1	544
.64320E	06	.46300E	01	.64520E	06	.46400E	01	.64590E	06	.42500E	01	28 3	1	545
.64720E	06	.35900E	01	.64620E	06	.38600E	01	.64900E	06	.45200E	01	28 3	1	546
.64950E	06	.53900E	01	.65000E	06	.57900E	01	.65020E	06	.59500E	01	28 3	1	547
.65120E	06	.49900E	01	.65200E	06	.39900E	01	.65280E	06	.35900E	01	28 3	1	548
.65380E	06	.37900E	01	.65430E	06	.42700E	01	.65450E	06	.44700E	01	28 3	1	549
.65560E	06	.35800E	01	.65610E	06	.30600E	01	.65740E	06	.20500E	01	28 3	1	550
.65840E	06	.19900E	01	.65920E	06	.22500E	01	.65970E	06	.29300E	01	28 3	1	551
.66020E	06	.38900E	01	.66070E	06	.48600E	01	.66120E	06	.48000E	01	28 3	1	552
.66230E	06	.36700E	01	.66310E	06	.32300E	01	.66380E	06	.29700E	01	28 3	1	553
.66440E	06	.30600E	01	.66510E	06	.34000E	01	.66590E	06	.25800E	01	28 3	1	554
.66670E	06	.21100E	01	.66750E	06	.24400E	01	.66800E	06	.20600E	01	28 3	1	555
.66880E	06	.21000E	01	.66940E	06	.26200E	01	.67000E	06	.36475E	01	28 3	1	556
.67020E	06	.39900E	01	.67070E	06	.43100E	01	.67120E	06	.39200E	01	28 3	1	557
.67170E	06	.41500E	01	.67250E	06	.46000E	01	.67360E	06	.46100E	01	28 3	1	558
.67410E	06	.46500E	01	.67490E	06	.50900E	01	.67570E	06	.47700E	01	28 3	1	559
.67650E	06	.47800E	01	.67740E	06	.44400E	01	.67820E	06	.37400E	01	28 3	1	560
.67870E	06	.34400E	01	.67950E	06	.35600E	01	.68000E	06	.37736E	01	28 3	1	561
.68060E	06	.40300E	01	.68170E	06	.40400E	01	.68250E	06	.38700E	01	28 3	1	562
.68330E	06	.41900E	01	.68410E	06	.43200E	01	.68520E	06	.40100E	01	28 3	1	563
.68600E	06	.39800E	01	.68690E	06	.39200E	01	.68770E	06	.36000E	01	28 3	1	564
.68850E	06	.34200E	01	.68930E	06	.38800E	01	.68990E	06	.43400E	01	28 3	1	565
.69000E	06	.44617E	01	.69050E	06	.50700E	01	.69130E	06	.43600E	01	28 3	1	566
.69180E	06	.40500E	01	.69240E	06	.40100E	01	.69300E	06	.40800E	01	28 3	1	567
.69380E	06	.29200E	01	.69430E	06	.25600E	01	.69490E	06	.27500E	01	28 3	1	568
.69570E	06	.37500E	01	.69600E	06	.40200E	01	.69660E	06	.33000E	01	28 3	1	569
.69740E	06	.22100E	01	.69800E	06	.20200E	01	.69860E	06	.19600E	01	28 3	1	570
.69910E	06	.29000E	01	.69970E	06	.37500E	01	.70000E	06	.39300E	01	28 3	1	571
.70080E	06	.43600E	01	.70170E	06	.48700E	01	.70250E	06	.52700E	01	28 3	1	572
.70310E	06	.51400E	01	.70450E	06	.37000E	01	.70540E	06	.35100E	01	28 3	1	573
.70620E	06	.40100E	01	.70680E	06	.47500E	01	.70770E	06	.45400E	01	28 3	1	574
.70910E	06	.31000E	01	.70970E	06	.27600E	01	.71030E	06	.27400E	01	28 3	1	575
.71080E	06	.26700E	01	.71140E	06	.23700E	01	.71200E	06	.28300E	01	28 3	1	576
.71310E	06	.30700E	01	.71370E	06	.29900E	01	.71460E	06	.29500E	01	28 3	1	577
.71610E	06	.22300E	01	.71720E	06	.17800E	01	.71870E	06	.18600E	01	28 3	1	578
.71960E	06	.23500E	01	.72080E	06	.32200E	01	.72140E	06	.34700E	01	28 3	1	579
.72190E	06	.35500E	01	.72280E	06	.34900E	01	.72430E	06	.28000E	01	28 3	1	580
.72520E	06	.28200E	01	.72670E	06	.31400E	01	.72730E	06	.31900E	01	28 3	1	581
.72880E	06	.27500E	01	.72900E	06	.26750E	01	.73000E	06	.23000E	01	28 3	1	582
.73060E	06	.23000E	01	.73120E	06	.25700E	01	.73180E	06	.26900E	01	28 3	1	583
.73240E	06	.21500E	01	.73300E	06	.22600E	01	.73360E	06	.28500E	01	28 3	1	584
.73420E	06	.23000E	01	.73520E	06	.14500E	01	.73640E	06	.11600E	01	28 3	1	585
.73730E	06	.16100E	01	.73790E	06	.19500E	01	.73910E	06	.30300E	01	28 3	1	586
.73970E	06	.26700E	01	.74030E	06	.24600E	01	.74100E	06	.19500E	01	28 3	1	587
.74160E	06	.14800E	01	.74220E	06	.11900E	01	.74280E	06	.11400E	01	28 3	1	588
.74340E	06	.15000E	01	.74440E	06	.24200E	01	.74500E	06	.26400E	01	28 3	1	589
.74530E	06	.22400E	01	.74590E	06	.23900E	01	.74680E	06	.23700E	01	28 3	1	590
.74810E	06	.27900E	01	.74870E	06	.25500E	01	.74900E	06	.25900E	01	28 3	1	591
.74930E	06	.27000E	01	.74970E	06	.29400E	01	.75000E	06	.29250E	01	28 3	1	592
.75030E	06	.29100E	01	.75120E	06	.36100E	01	.75150E	06	.37300E	01	28 3	1	593
.75190E	06	.36200E	01	.75310E	06	.27000E	01	.75370E	06	.26500E	01	28 3	1	594
.75440E	06	.29800E	01	.75600E	06	.36400E	01	.75720E	06	.40600E	01	28 3	1	595
.75760E	06	.39300E	01	.75910E	06	.42800E	01	.76040E	06	.47500E	01	28 3	1	596
.76200E	06	.44600E	01	.76330E	06	.37700E	01	.76400E	06	.38400E	01	28 3	1	597
.76460E	06	.35100E	01	.76590E	06	.23700E	01	.76690E	06	.16900E	01	28 3	1	598
.76750E	06	.17400E	01	.76820E	06	.18000E	01	.76910E	06	.27300E	01	28 3	1	599

.76980E	06	.31500E	01	.77060E	06	.34200E	01	.77210E	06	.34800E	01	28 3	1	600
.77370E	06	.35600E	01	.77470E	06	.39500E	01	.77570E	06	.46100E	01	28 3	1	601
.77600E	06	.41200E	01	.77640E	06	.38700E	01	.77700E	06	.34800E	01	28 3	1	602
.77800E	06	.33100E	01	.77900E	06	.30100E	01	.78030E	06	.29100E	01	28 3	1	603
.78100E	06	.27960E	01	.78300E	06	.24700E	01	.78430E	06	.27500E	01	28 3	1	604
.78530E	06	.33500E	01	.78600E	06	.35600E	01	.78670E	06	.34000E	01	28 3	1	605
.78740E	06	.32700E	01	.78940E	06	.35000E	01	.79040E	06	.43100E	01	28 3	1	606
.79140E	06	.47900E	01	.79210E	06	.47900E	01	.79380E	06	.35700E	01	28 3	1	607
.79480E	06	.30000E	01	.79650E	06	.21700E	01	.79720E	06	.21200E	01	28 3	1	608
.79830E	06	.23900E	01	.79960E	06	.38800E	01	.80000E	06	.42171E	01	28 3	1	609
.80030E	06	.44700E	01	.80070E	06	.46600E	01	.80140E	06	.41500E	01	28 3	1	610
.80240E	06	.37300E	01	.80450E	06	.35100E	01	.80620E	06	.34000E	01	28 3	1	611
.80690E	06	.34800E	01	.80830E	06	.35900E	01	.80900E	06	.38600E	01	28 3	1	612
.81010E	06	.35100E	01	.81120E	06	.34500E	01	.81190E	06	.32800E	01	28 3	1	613
.81290E	06	.34200E	01	.81400E	06	.35600E	01	.81500E	06	.25800E	01	28 3	1	614
.81650E	06	.19100E	01	.81790E	06	.12000E	01	.81860E	06	.13700E	01	28 3	1	615
.81930E	06	.16900E	01	.82040E	06	.24700E	01	.82110E	06	.32500E	01	28 3	1	616
.82180E	06	.37000E	01	.82260E	06	.39700E	01	.82440E	06	.47600E	01	28 3	1	617
.82500E	06	.37060E	01	.82540E	06	.34700E	01	.82620E	06	.31600E	01	28 3	1	618
.82760E	06	.37600E	01	.82870E	06	.43600E	01	.83020E	06	.44000E	01	28 3	1	619
.83200E	06	.42100E	01	.83270E	06	.37300E	01	.83350E	06	.38100E	01	28 3	1	620
.83490E	06	.37900E	01	.83600E	06	.33000E	01	.83710E	06	.37700E	01	28 3	1	621
.83790E	06	.40700E	01	.83860E	06	.35300E	01	.83940E	06	.28000E	01	28 3	1	622
.84050E	06	.31300E	01	.84120E	06	.35000E	01	.84200E	06	.35500E	01	28 3	1	623
.84230E	06	.33100E	01	.84350E	06	.29000E	01	.84530E	06	.36200E	01	28 3	1	624
.84610E	06	.33800E	01	.84720E	06	.37400E	01	.84830E	06	.45000E	01	28 3	1	625
.84870E	06	.46000E	01	.84910E	06	.44600E	01	.85000E	06	.33718E	01	28 3	1	626
.85020E	06	.31300E	01	.85170E	06	.29700E	01	.85360E	06	.30100E	01	28 3	1	627
.85440E	06	.33100E	01	.85480E	06	.33400E	01	.85560E	06	.31900E	01	28 3	1	628
.85630E	06	.27000E	01	.85790E	06	.23000E	01	.85940E	06	.19400E	01	28 3	1	629
.86130E	06	.19000E	01	.86320E	06	.16700E	01	.86400E	06	.19700E	01	28 3	1	630
.86480E	06	.24700E	01	.86600E	06	.31600E	01	.86640E	06	.32100E	01	28 3	1	631
.86750E	06	.23400E	01	.86790E	06	.22100E	01	.86870E	06	.22500E	01	28 3	1	632
.86950E	06	.25800E	01	.87060E	06	.31700E	01	.87300E	06	.32800E	01	28 3	1	633
.87340E	06	.30600E	01	.87420E	06	.31200E	01	.87540E	06	.32900E	01	28 3	1	634
.87770E	06	.33800E	01	.87850E	06	.28900E	01	.87900E	06	.27150E	01	28 3	1	635
.87930E	06	.26100E	01	.88090E	06	.24300E	01	.88170E	06	.20000E	01	28 3	1	636
.88210E	06	.18800E	01	.88250E	06	.21000E	01	.88290E	06	.24900E	01	28 3	1	637
.88370E	06	.34800E	01	.88410E	06	.35100E	01	.88530E	06	.28600E	01	28 3	1	638
.88610E	06	.27200E	01	.88650E	06	.27400E	01	.88740E	06	.29700E	01	28 3	1	639
.88820E	06	.34500E	01	.88900E	06	.43100E	01	.88980E	06	.50000E	01	28 3	1	640
.89020E	06	.50500E	01	.89140E	06	.42200E	01	.89180E	06	.39400E	01	28 3	1	641
.89300E	06	.41900E	01	.89390E	06	.38700E	01	.89470E	06	.36800E	01	28 3	1	642
.89630E	06	.37100E	01	.89670E	06	.35000E	01	.89750E	06	.32200E	01	28 3	1	643
.89830E	06	.34500E	01	.89960E	06	.38700E	01	.90000E	06	.41900E	01	28 3	1	644
.90060E	06	.45900E	01	.90160E	06	.50200E	01	.90250E	06	.47000E	01	28 3	1	645
.90330E	06	.40900E	01	.90450E	06	.39000E	01	.90540E	06	.39300E	01	28 3	1	646
.90660E	06	.41300E	01	.90750E	06	.39100E	01	.90910E	06	.40400E	01	28 3	1	647
.91040E	06	.38500E	01	.91210E	06	.35900E	01	.91370E	06	.34300E	01	28 3	1	648
.91540E	06	.32900E	01	.91670E	06	.35600E	01	.91760E	06	.35200E	01	28 3	1	649
.91970E	06	.29800E	01	.92050E	06	.33400E	01	.92180E	06	.32700E	01	28 3	1	650
.92350E	06	.37200E	01	.92440E	06	.38500E	01	.92520E	06	.35500E	01	28 3	1	651
.92610E	06	.28300E	01	.92740E	06	.23700E	01	.92900E	06	.19510E	01	28 3	1	652
.92950E	06	.18200E	01	.93080E	06	.26800E	01	.93210E	06	.36600E	01	28 3	1	653
.93260E	06	.39700E	01	.93350E	06	.38600E	01	.93480E	06	.35000E	01	28 3	1	654
.93650E	06	.35500E	01	.93760E	06	.36600E	01	.93830E	06	.37600E	01	28 3	1	655
.93910E	06	.35200E	01	.94000E	06	.29600E	01	.94130E	06	.26800E	01	28 3	1	656
.94270E	06	.33000E	01	.94350E	06	.36800E	01	.94490E	06	.34000E	01	28 3	1	657
.94560E	06	.34300E	01	.94750E	06	.30000E	01	.94980E	06	.24100E	01	28 3	1	658
.95000E	06	.23989E	01	.95160E	06	.23100E	01	.95250E	06	.26200E	01	28 3	1	659

.95380E	06	.33200E	01	.95470E	06	.35000E	01	.95610E	06	.30500E	01	28 3	1	660
.95790E	06	.28500E	01	.95880E	06	.31200E	01	.95970E	06	.37400E	01	28 3	1	661
.96060E	06	.39400E	01	.96240E	06	.33400E	01	.96420E	06	.27300E	01	28 3	1	662
.96510E	06	.29100E	01	.96610E	06	.30200E	01	.96740E	06	.30500E	01	28 3	1	663
.96880E	06	.32400E	01	.97020E	06	.25900E	01	.97160E	06	.22700E	01	28 3	1	664
.97340E	06	.25600E	01	.97480E	06	.23900E	01	.97620E	06	.25600E	01	28 3	1	665
.97610E	06	.29100E	01	.97900E	06	.37700E	01	.98000E	06	.43700E	01	28 3	1	666
.98090E	06	.43500E	01	.98160E	06	.40800E	01	.98320E	06	.39300E	01	28 3	1	667
.98510E	06	.31500E	01	.98700E	06	.26000E	01	.98800E	06	.27700E	01	28 3	1	668
.98940E	06	.35000E	01	.99030E	06	.36300E	01	.99130E	06	.34700E	01	28 3	1	669
.99270E	06	.31500E	01	.99510E	06	.30200E	01	.99700E	06	.28500E	01	28 3	1	670
.99850E	06	.35400E	01	.99940E	06	.36900E	01	.99990E	06	.34400E	01	28 3	1	671
.10000E	07	.33500E	01	.10020E	07	.29700E	01	.10040E	07	.31600E	01	28 3	1	672
.10060E	07	.27200E	01	.10080E	07	.35000E	01	.10130E	07	.25100E	01	28 3	1	673
.10150E	07	.28300E	01	.10160E	07	.30900E	01	.10180E	07	.22000E	01	28 3	1	674
.10200E	07	.23900E	01	.10220E	07	.18100E	01	.10260E	07	.33900E	01	28 3	1	675
.10290E	07	.35600E	01	.10320E	07	.24300E	01	.10330E	07	.24200E	01	28 3	1	676
.10350E	07	.29400E	01	.10380E	07	.31400E	01	.10400E	07	.27467E	01	28 3	1	677
.10410E	07	.25500E	01	.10430E	07	.31500E	01	.10440E	07	.41600E	01	28 3	1	678
.10460E	07	.36600E	01	.10500E	07	.26500E	01	.10520E	07	.31500E	01	28 3	1	679
.10550E	07	.19200E	01	.10570E	07	.21900E	01	.10590E	07	.28600E	01	28 3	1	680
.10610E	07	.31800E	01	.10630E	07	.33900E	01	.10670E	07	.21300E	01	28 3	1	681
.10700E	07	.23500E	01	.10730E	07	.31200E	01	.10750E	07	.24600E	01	28 3	1	682
.10760E	07	.21300E	01	.10790E	07	.31800E	01	.10810E	07	.37200E	01	28 3	1	683
.10830E	07	.43000E	01	.10860E	07	.37600E	01	.10890E	07	.36300E	01	28 3	1	684
.10930E	07	.19500E	01	.10960E	07	.19600E	01	.10980E	07	.25700E	01	28 3	1	685
.11000E	07	.30233E	01	.11010E	07	.32500E	01	.11040E	07	.29100E	01	28 3	1	686
.11050E	07	.30583E	01	.11100E	07	.38000E	01	.11120E	07	.35900E	01	28 3	1	687
.11140E	07	.41100E	01	.11180E	07	.29200E	01	.11210E	07	.21600E	01	28 3	1	688
.11240E	07	.28400E	01	.11280E	07	.16600E	01	.11310E	07	.28100E	01	28 3	1	689
.11350E	07	.31400E	01	.11380E	07	.21700E	01	.11390E	07	.19800E	01	28 3	1	690
.11400E	07	.23700E	01	.11430E	07	.37600E	01	.11450E	07	.37000E	01	28 3	1	691
.11480E	07	.32600E	01	.11500E	07	.36500E	01	.11520E	07	.37700E	01	28 3	1	692
.11540E	07	.42900E	01	.11560E	07	.46100E	01	.11600E	07	.32200E	01	28 3	1	693
.11630E	07	.35100E	01	.11660E	07	.40500E	01	.11680E	07	.35300E	01	28 3	1	694
.11700E	07	.41700E	01	.11720E	07	.41000E	01	.11740E	07	.27600E	01	28 3	1	695
.11770E	07	.17400E	01	.11790E	07	.22400E	01	.11800E	07	.24900E	01	28 3	1	696
.11820E	07	.25800E	01	.11860E	07	.30800E	01	.11890E	07	.31700E	01	28 3	1	697
.11920E	07	.30400E	01	.11940E	07	.33500E	01	.11970E	07	.25700E	01	28 3	1	698
.11990E	07	.26900E	01	.12000E	07	.27300E	01	.12020E	07	.29200E	01	28 3	1	699
.12050E	07	.30800E	01	.12060E	07	.28900E	01	.12100E	07	.33900E	01	28 3	1	700
.12120E	07	.38100E	01	.12130E	07	.39100E	01	.12150E	07	.34900E	01	28 3	1	701
.12170E	07	.27400E	01	.12190E	07	.33300E	01	.12210E	07	.42200E	01	28 3	1	702
.12220E	07	.43200E	01	.12240E	07	.38000E	01	.12260E	07	.42500E	01	28 3	1	703
.12270E	07	.46200E	01	.12280E	07	.45000E	01	.12290E	07	.39200E	01	28 3	1	704
.12300E	07	.31700E	01	.12320E	07	.25000E	01	.12340E	07	.26400E	01	28 3	1	705
.12350E	07	.31500E	01	.12360E	07	.39600E	01	.12370E	07	.42600E	01	28 3	1	706
.12380E	07	.42800E	01	.12390E	07	.39800E	01	.12410E	07	.33800E	01	28 3	1	707
.12430E	07	.26400E	01	.12450E	07	.28000E	01	.12470E	07	.30200E	01	28 3	1	708
.12490E	07	.30600E	01	.12510E	07	.35900E	01	.12520E	07	.37600E	01	28 3	1	709
.12540E	07	.32900E	01	.12580E	07	.34000E	01	.12600E	07	.32067E	01	28 3	1	710
.12610E	07	.31100E	01	.12630E	07	.35400E	01	.12650E	07	.37200E	01	28 3	1	711
.12670E	07	.33500E	01	.12690E	07	.28900E	01	.12700E	07	.26500E	01	28 3	1	712
.12720E	07	.33900E	01	.12740E	07	.39800E	01	.12760E	07	.37000E	01	28 3	1	713
.12770E	07	.31200E	01	.12780E	07	.27800E	01	.12800E	07	.35300E	01	28 3	1	714
.12810E	07	.39000E	01	.12840E	07	.38500E	01	.12850E	07	.37533E	01	28 3	1	715
.12870E	07	.35600E	01	.12890E	07	.43200E	01	.12910E	07	.48400E	01	28 3	1	716
.12930E	07	.50500E	01	.12950E	07	.46600E	01	.12960E	07	.40600E	01	28 3	1	717
.12990E	07	.30700E	01	.13000E	07	.33300E	01	.13020E	07	.35200E	01	28 3	1	718
.13050E	07	.34000E	01	.13080E	07	.33000E	01	.13110E	07	.34900E	01	28 3	1	719

.13140E 07	.37900E 01	.13160E 07	.43600E 01	.13190E 07	.44300E 01	28	3	1	720
.13210E 07	.35800E 01	.13230E 07	.31600E 01	.13260E 07	.37200E 01	28	3	1	721
.13280E 07	.35400E 01	.13290E 07	.35700E 01	.13300E 07	.39800E 01	28	3	1	722
.13320E 07	.42900E 01	.13350E 07	.34700E 01	.13380E 07	.32600E 01	28	3	1	723
.13390E 07	.32567E 01	.13400E 07	.32533E 01	.13410E 07	.32500E 01	28	3	1	724
.13440E 07	.40300E 01	.13450E 07	.42900E 01	.13470E 07	.42200E 01	28	3	1	725
.13490E 07	.46400E 01	.13530E 07	.44000E 01	.13550E 07	.37867E 01	28	3	1	726
.13560E 07	.34800E 01	.13590E 07	.28100E 01	.13600E 07	.27125E 01	28	3	1	727
.13630E 07	.24200E 01	.13650E 07	.22000E 01	.13670E 07	.25600E 01	28	3	1	728
.13690E 07	.33700E 01	.13700E 07	.38300E 01	.13720E 07	.35200E 01	28	3	1	729
.13740E 07	.38600E 01	.13750E 07	.39200E 01	.13780E 07	.36600E 01	28	3	1	730
.13810E 07	.37900E 01	.13840E 07	.36000E 01	.13860E 07	.28700E 01	28	3	1	731
.13880E 07	.28000E 01	.13890E 07	.31300E 01	.13910E 07	.33000E 01	28	3	1	732
.13960E 07	.22800E 01	.13980E 07	.24200E 01	.13990E 07	.28200E 01	28	3	1	733
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.14060E 07	.26200E 01	.14080E 07	.32000E 01	.14120E 07	.33100E 01	28	3	1	735
.14140E 07	.30500E 01	.14160E 07	.29900E 01	.14190E 07	.33000E 01	28	3	1	736
.14200E 07	.32200E 01	.14230E 07	.35900E 01	.14250E 07	.40200E 01	28	3	1	737
.14270E 07	.35000E 01	.14290E 07	.34000E 01	.14320E 07	.42200E 01	28	3	1	738
.14330E 07	.42100E 01	14360E 07	.31800E 01	.14400E 07	.32800E 01	28	3	1	739
.14420E 07	.28400E 01	.14440E 07	.27000E 01	.14480E 07	.32000E 01	28	3	1	740
.14500E 07	.36300E 01	.14520E 07	.35400E 01	.14550E 07	.32100E 01	28	3	1	741
.14560E 07	.31600E 01	.14600E 07	.37400E 01	.14650E 07	.40800E 01	28	3	1	742
.14670E 07	.39900E 01	.14710E 07	.42000E 01	.14750E 07	.31400E 01	28	3	1	743
.14780E 07	.31400E 01	.14790E 07	.34500E 01	.14800E 07	.37600E 01	28	3	1	744
.14810E 07	.37600E 01	.14830E 07	.33100E 01	.14850E 07	.31000E 01	28	3	1	745
.14870E 07	.30700E 01	.14920E 07	.33700E 01	.14940E 07	.33500E 01	28	3	1	746
.15000E 07	.40271E 01	.15010E 07	.41400E 01	.15040E 07	.37700E 01	28	3	1	747
.15070E 07	.31600E 01	.15100E 07	.25200E 01	.15110E 07	.25200E 01	28	3	1	748
.15160E 07	.36200E 01	.15170E 07	.37100E 01	.15260E 07	.28100E 01	28	3	1	749
.15290E 07	.32700E 01	.15320E 07	.32200E 01	.15380E 07	.28000E 01	28	3	1	750
.15420E 07	.27200E 01	.15460E 07	.34400E 01	.15480E 07	.38500E 01	28	3	1	751
.15490E 07	.38500E 01	.15500E 07	.35700E 01	.15520E 07	.30100E 01	28	3	1	752
.15560E 07	.26500E 01	.15580E 07	.31800E 01	.15600E 07	.36100E 01	28	3	1	753
.15620E 07	.34900E 01	.15640E 07	.31800E 01	.15660E 07	.32600E 01	28	3	1	754
.15690E 07	.35100E 01	.15730E 07	.30300E 01	.15770E 07	.32700E 01	28	3	1	755
.15790E 07	.31300E 01	.15820E 07	.33300E 01	.15840E 07	.33100E 01	28	3	1	756
.15890E 07	.30600E 01	.15920E 07	.24500E 01	.15960E 07	.21400E 01	28	3	1	757
.15990E 07	.23700E 01	.16000E 07	.25200E 01	.16020E 07	.28000E 01	28	3	1	758
.16030E 07	.28300E 01	.16050E 07	.27000E 01	.16060E 07	.27800E 01	28	3	1	759
.16080E 07	.35300E 01	.16100E 07	.44300E 01	.16110E 07	.45300E 01	28	3	1	760
.16130E 07	.40000E 01	.16160E 07	.35900E 01	.16180E 07	.33900E 01	28	3	1	761
.16210E 07	.34600E 01	.16240E 07	.32700E 01	.16270E 07	.36000E 01	28	3	1	762
.16280E 07	.34600E 01	.16310E 07	.27700E 01	.16350E 07	.26500E 01	28	3	1	763
.16390E 07	.28100E 01	.16410E 07	.29000E 01	.16420E 07	.27200E 01	28	3	1	764
.16450E 07	.31300E 01	.16460E 07	.31600E 01	.16480E 07	.30400E 01	28	3	1	765
.16500E 07	.31900E 01	.16520E 07	.33400E 01	.16530E 07	.32900E 01	28	3	1	766
.16560E 07	.31100E 01	.16590E 07	.29800E 01	.16620E 07	.32700E 01	28	3	1	767
.16650E 07	.40200E 01	.16670E 07	.41500E 01	.16680E 07	.39700E 01	28	3	1	768
.16710E 07	.37900E 01	.16720E 07	.37700E 01	.16750E 07	.35000E 01	28	3	1	769
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.16870E 07	.32100E 01	.16890E 07	.30300E 01	.16930E 07	.25000E 01	28	3	1	771
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.17020E 07	.38700E 01	.17040E 07	.41500E 01	.17060E 07	.39300E 01	28	3	1	773
.17080E 07	.36900E 01	.17100E 07	.37200E 01	.17110E 07	.39700E 01	28	3	1	774
.17140E 07	.39400E 01	.17170E 07	.36400E 01	.17200E 07	.31900E 01	28	3	1	775
.17220E 07	.30500E 01	.17240E 07	.30300E 01	.17260E 07	.30800E 01	28	3	1	776
.17290E 07	.30100E 01	.17320E 07	.28400E 01	.17340E 07	.30400E 01	28	3	1	777
.17370E 07	.31900E 01	.17400E 07	.32700E 01	.17420E 07	.31100E 01	28	3	1	778
.17440E 07	.29100E 01	.17460E 07	.30100E 01	.17500E 07	.30200E 01	28	3	1	779

.17540E	07	.28000E	01	.17550E	07	.28200E	01	.17590E	07	.31600E	01	28	3	1	780
.17600E	07	.30500E	01	.17630E	07	.26300E	01	.17650E	07	.25200E	01	28	3	1	781
.17670E	07	.25500E	01	.17690E	07	.28400E	01	.17720E	07	.33000E	01	28	3	1	782
.17750E	07	.32900E	01	.17770E	07	.30600E	01	.17800E	07	.28200E	01	28	3	1	783
.17830E	07	.28400E	01	.17860E	07	.27400E	01	.17870E	07	.28100E	01	28	3	1	784
.17900E	07	.31500E	01	.17930E	07	.39900E	01	.17950E	07	.43200E	01	28	3	1	785
.17980E	07	.44500E	01	.17990E	07	.43700E	01	.18000E	07	.42800E	01	28	3	1	786
.18020E	07	.39700E	01	.18050E	07	.39400E	01	.18080E	07	.41800E	01	28	3	1	787
.18120E	07	.36100E	01	.18150E	07	.32200E	01	.18180E	07	.29600E	01	28	3	1	788
.18200E	07	.26600E	01	.18220E	07	.28000E	01	.18240E	07	.29200E	01	28	3	1	789
.18250E	07	.29400E	01	.18280E	07	.26600E	01	.18320E	07	.26300E	01	28	3	1	790
.18350E	07	.28400E	01	.18380E	07	.28900E	01	.18410E	07	.29600E	01	28	3	1	791
.18430E	07	.30200E	01	.18450E	07	.33700E	01	.18490E	07	.30700E	01	28	3	1	792
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.18600E	07	.29400E	01	.18610E	07	.29200E	01	.18630E	07	.25200E	01	28	3	1	794
.18670E	07	.22200E	01	.18720E	07	.22300E	01	.18750E	07	.23800E	01	28	3	1	795
.18780E	07	.24000E	01	.18820E	07	.28400E	01	.18840E	07	.31400E	01	28	3	1	796
.18870E	07	.33400E	01	.18880E	07	.33300E	01	.18910E	07	.31100E	01	28	3	1	797
.18930E	07	.30100E	01	.18960E	07	.30000E	01	.19000E	07	.34480E	01	28	3	1	798
.19010E	07	.35600E	01	.19030E	07	.34200E	01	.19060E	07	.32500E	01	28	3	1	799
.19080E	07	.32700E	01	.19100E	07	.33600E	01	.19110E	07	.33600E	01	28	3	1	800
.19120E	07	.32200E	01	.19150E	07	.31000E	01	.19170E	07	.29300E	01	28	3	1	801
.19210E	07	.26700E	01	.19240E	07	.25900E	01	.19260E	07	.24700E	01	28	3	1	802
.19280E	07	.23300E	01	.19300E	07	.23500E	01	.19340E	07	.25400E	01	28	3	1	803
.19370E	07	.27300E	01	.19410E	07	.31800E	01	.19430E	07	.33300E	01	28	3	1	804
.19460E	07	.33500E	01	.19470E	07	.32800E	01	.19490E	07	.31300E	01	28	3	1	805
.19500E	07	.28800E	01	.19510E	07	.26300E	01	.19540E	07	.23800E	01	28	3	1	806
.19560E	07	.23000E	01	.19590E	07	.24900E	01	.19620E	07	.27000E	01	28	3	1	807
.19640E	07	.28900E	01	.19660E	07	.29100E	01	.19680E	07	.28700E	01	28	3	1	808
.19710E	07	.30800E	01	.19740E	07	.32300E	01	.19760E	07	.34500E	01	28	3	1	809
.19790E	07	.35700E	01	.19820E	07	.31600E	01	.19850E	07	.29000E	01	28	3	1	810
.19890E	07	.29800E	01	.19910E	07	.31200E	01	.19950E	07	.31400E	01	28	3	1	811
.19970E	07	.31100E	01	.19990E	07	.29800E	01	.20000E	07	.29950E	01	28	3	1	812
.20010E	07	.30100E	01	.20050E	07	.28600E	01	.20090E	07	.30300E	01	28	3	1	813
.20130E	07	.28500E	01	.20170E	07	.31100E	01	.20190E	07	.30900E	01	28	3	1	814
.20210E	07	.28800E	01	.20270E	07	.32100E	01	.20300E	07	.32400E	01	28	3	1	815
.20340E	07	.38000E	01	.20400E	07	.34900E	01	.20450E	07	.32400E	01	28	3	1	816
.20520E	07	.29700E	01	.20550E	07	.31500E	01	.20590E	07	.34400E	01	28	3	1	817
.20610E	07	.34700E	01	.20670E	07	.32400E	01	.20720E	07	.29600E	01	28	3	1	818
.20740E	07	.28700E	01	.20780E	07	.30100E	01	.20830E	07	.29600E	01	28	3	1	819
.20840E	07	.29700E	01	.20900E	07	.29700E	01	.20930E	07	.32800E	01	28	3	1	820
.20970E	07	.29100E	01	.21000E	07	.27950E	01	.21030E	07	.26800E	01	28	3	1	821
.21090E	07	.30400E	01	.21130E	07	.28500E	01	.21190E	07	.31000E	01	28	3	1	822
.21220E	07	.35000E	01	.21300E	07	.37300E	01	.21340E	07	.34400E	01	28	3	1	823
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.21900E	07	.30400E	01	.21950E	07	.30900E	01	.21960E	07	.31000E	01	28	3	1	828
.22000E	07	.30000E	01	.22020E	07	.29500E	01	.22050E	07	.28100E	01	28	3	1	829
.22080E	07	.31300E	01	.22160E	07	.27700E	01	.22200E	07	.26490E	01	28	3	1	830
.22290E	07	.34500E	01	.22320E	07	.34900E	01	.22370E	07	.30600E	01	28	3	1	831
.22410E	07	.29700E	01	.22490E	07	.32100E	01	.22500E	07	.31600E	01	28	3	1	832
.22550E	07	.29100E	01	.22560E	07	.31100E	01	.22650E	07	.34200E	01	28	3	1	833
.22730E	07	.33200E	01	.22820E	07	.28000E	01	.22880E	07	.33800E	01	28	3	1	834
.22900E	07	.34500E	01	.22930E	07	.32400E	01	.22980E	07	.34900E	01	28	3	1	835
.23000E	07	.33500E	01	.23030E	07	.31400E	01	.23070E	07	.34500E	01	28	3	1	836
.23100E	07	.39100E	01	.23150E	07	.34200E	01	.23190E	07	.34700E	01	28	3	1	837
.23240E	07	.30300E	01	.23270E	07	.30800E	01	.23320E	07	.33700E	01	28	3	1	838
.23410E	07	.29600E	01	.23480E	07	.35400E	01	.23530E	07	.36000E	01	28	3	1	839

.23570E	07	.34700E	01	.23640E	07	.35100E	01	.23720E	07	.28500E	01	28	3	1	840
.23780E	07	.27100E	01	.23810E	07	.29700E	01	.23870E	07	.32300E	01	28	3	1	841
.23920E	07	.30700E	01	.23940E	07	.31400E	01	.23970E	07	.36200E	01	28	3	1	842
.23990E	07	.36200E	01	.24000E	07	.35571E	01	.24060E	07	.31800E	01	28	3	1	843
.24100E	07	.32800E	01	.24140E	07	.31200E	01	.24190E	07	.27900E	01	28	3	1	844
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.24460E	07	.33200E	01	.24540E	07	.36200E	01	.24580E	07	.34900E	01	28	3	1	846
.24610E	07	.32600E	01	.24690E	07	.33800E	01	.24750E	07	.39900E	01	28	3	1	847
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.25000E	07	.32050E	01	.25010E	07	.31600E	01	.25050E	07	.30200E	01	28	3	1	850
.25110E	07	.30300E	01	.25160E	07	.31100E	01	.25200E	07	.30700E	01	28	3	1	851
.25240E	07	.33200E	01	.25280E	07	.36100E	01	.25340E	07	.32900E	01	28	3	1	852
.25400E	07	.31900E	01	.25440E	07	.31600E	01	.25480E	07	.33333E	01	28	3	1	853
.25500E	07	.34200E	01	.25560E	07	.36200E	01	.25610E	07	.36000E	01	28	3	1	854
.25690E	07	.32900E	01	.25770E	07	.29900E	01	.25850E	07	.34500E	01	28	3	1	855
.25910E	07	.31900E	01	.25970E	07	.31100E	01	.26000E	07	.31520E	01	28	3	1	856
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.26180E	07	.33700E	01	.26240E	07	.31000E	01	.26300E	07	.32200E	01	28	3	1	858
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.27190E	07	.32600E	01	.27250E	07	.34500E	01	.27300E	07	.35100E	01	28	3	1	865
.27360E	07	.33500E	01	.27430E	07	.34900E	01	.27450E	07	.34900E	01	28	3	1	866
.27520E	07	.31200E	01	.27560E	07	.30500E	01	.27610E	07	.31600E	01	28	3	1	867
.27690E	07	.37000E	01	.27720E	07	.36500E	01	.27760E	07	.33900E	01	28	3	1	868
.27810E	07	.33400E	01	.27850E	07	.34900E	01	.27900E	07	.33900E	01	28	3	1	869
.27960E	07	.30400E	01	.28000E	07	.32171E	01	.28030E	07	.33500E	01	28	3	1	870
.28100E	07	.38300E	01	.28150E	07	.37400E	01	.28190E	07	.37100E	01	28	3	1	871
.28220E	07	.35233E	01	.28280E	07	.31500E	01	.28350E	07	.29200E	01	28	3	1	872
.28440E	07	.29800E	01	.28510E	07	.33400E	01	.28580E	07	.34100E	01	28	3	1	873
.28630E	07	.33200E	01	.28700E	07	.37500E	01	.28730E	07	.37200E	01	28	3	1	874
.28800E	07	.34000E	01	.28840E	07	.32300E	01	.28910E	07	.33200E	01	28	3	1	875
.28960E	07	.34400E	01	.29000E	07	.33771E	01	.29030E	07	.33300E	01	28	3	1	876
.29110E	07	.33800E	01	.29180E	07	.35900E	01	.29250E	07	.33000E	01	28	3	1	877
.29300E	07	.32300E	01	.29370E	07	.33800E	01	.29400E	07	.33200E	01	28	3	1	878
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.29620E	07	.32400E	01	.29720E	07	.40000E	01	.29740E	07	.40100E	01	28	3	1	880
.29800E	07	.36550E	01	.29860E	07	.33000E	01	.29910E	07	.31900E	01	28	3	1	881
.29990E	07	.34000E	01	.30000E	07	.34250E	01	.30010E	07	.34500E	01	28	3	1	882
.30090E	07	.33400E	01	.30100E	07	.33512E	01	.30170E	07	.34300E	01	28	3	1	883
.30240E	07	.32600E	01	.30320E	07	.31300E	01	.30370E	07	.31400E	01	28	3	1	884
.30400E	07	.32487E	01	.30450E	07	.34300E	01	.30500E	07	.33200E	01	28	3	1	885
.30580E	07	.35400E	01	.30700E	07	.32800E	01	.30800E	07	.31436E	01	28	3	1	886
.30810E	07	.31300E	01	.30910E	07	.31800E	01	.30990E	07	.30000E	01	28	3	1	887
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.31340E	07	.30600E	01	.31450E	07	.33600E	01	.31470E	07	.34400E	01	28	3	1	889
.31500E	07	.34300E	01	.31580E	07	.31200E	01	.31660E	07	.30600E	01	28	3	1	890
.31690E	07	.31300E	01	.31770E	07	.29700E	01	.31800E	07	.30000E	01	28	3	1	891
.31880E	07	.34300E	01	.31910E	07	.35400E	01	.32000E	07	.35318E	01	28	3	1	892
.32020E	07	.35300E	01	.32080E	07	.35200E	01	.32130E	07	.34300E	01	28	3	1	893
.32220E	07	.33100E	01	.32330E	07	.33100E	01	.32470E	07	.33000E	01	28	3	1	894
.32500E	07	.33218E	01	.32580E	07	.33800E	01	.32600E	07	.33933E	01	28	3	1	895
.32640E	07	.34200E	01	.32700E	07	.33500E	01	.32780E	07	.33000E	01	28	3	1	896
.32800E	07	.33250E	01	.32900E	07	.34500E	01	.33000E	07	.35318E	01	28	3	1	897
.33010E	07	.35400E	01	.33040E	07	.35000E	01	.33190E	07	.34800E	01	28	3	1	898
.33200E	07	.34956E	01	.33250E	07	.35733E	01	.33280E	07	.36200E	01	28	3	1	899

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.33570E 07	.34000E 01	.33720E 07	.34300E 01	.33840E 07	.33900E 01	28	3	1	901
.33900E 07	.34300E 01	.33990E 07	.34700E 01	.34000E 07	.34550E 01	28	3	1	902
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.35370E 07	.36700E 01	.35460E 07	.35600E 01	.35490E 07	.35600E 01	28	3	1	908
.35500E 07	.35500E 01	.35560E 07	.34900E 01	.35660E 07	.36500E 01	28	3	1	909
.35750E 07	.35400E 01	.35850E 07	.34800E 01	.35950E 07	.36100E 01	28	3	1	910
.36000E 07	.35700E 01	.36050E 07	.35300E 01	.36150E 07	.34800E 01	28	3	1	911
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.36620E 07	.36300E 01	.36690E 07	.37700E 01	.36720E 07	.37400E 01	28	3	1	913
.36790E 07	.35200E 01	.36820E 07	.34400E 01	.36890E 07	.33764E 01	28	3	1	914
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.37130E 07	.33500E 01	.37200E 07	.33900E 01	.37270E 07	.33600E 01	28	3	1	916
.37310E 07	.32900E 01	.37410E 07	.36000E 01	.37480E 07	.37000E 01	28	3	1	917
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.40540E 07	.37200E 01	.40610E 07	.34800E 01	.40890E 07	.35500E 01	28	3	1	927
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.42000E 07	.35821E 01	.42200E 07	.35700E 01	.42330E 07	.36400E 01	28	3	1	930
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 .00000E 00 .00000E 00                                              28 3  0  983
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0.00000E+00 0.0000E+00         0          0          2       2519   28 3  2  985
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3.26699+ 0 7.76250+ 0 4.34836+ 0 7.76150+ 0 5.78767+ 0 7.76000+ 0   28 3  2  993
7.70338+ 0 7.75820+ 0 1.02532+ 1 7.75580+ 0 1.36470+ 1 7.75240+ 0   28 3  2  994
1.81642+ 1 7.74810+ 0 2.41765+ 1 7.74230+ 0 3.21789+ 1 7.73460+ 0   28 3  2  995
4.28302+ 1 7.72430+ 0 5.70070+ 1 7.71060+ 0 7.58763+ 1 7.69260+ 0   28 3  2  996
1.00991+ 2 7.65840+ 0 1.22199+ 2 7.64820+ 0 1.62648+ 2 7.60950+ 0   28 3  2  997
2.16484+ 2 7.55820+ 0 2.88140+ 2 7.49030+ 0 3.83514+ 2 7.40040+ 0   28 3  2  998
5.10458+ 2 7.28190+ 0 6.17654+ 2 7.18270+ 0 8.22097+ 2 6.99560+ 0   28 3  2  999
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1.29245+ 3 6.57670+ 0 1.29266+ 3 6.57650+ 0 1.29342+ 3 6.57590+ 0   28 3  2 1003
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5.54488+ 3 2.50200+ 0 5.86555+ 3 2.19260+ 0 6.88784+ 3 1.35510+ 0   28 3  2 1018
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3.20174+ 4	1.01700- 1	3.21600+ 4	7.77000- 2	3.22175+ 4	6.88000- 2	28	3	2	1079

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3,23608+ 4	6,52000- 2	3,23733+ 4	7,57000- 2	3,23818+ 4	9,29000- 2	28	3	2	1081
3,23876+ 4	1,18500- 1	3,23916+ 4	1,53000- 1	3,23943+ 4	2,08700- 1	28	3	2	1082
3,23961+ 4	2,66900- 1	3,23973+ 4	2,79800- 1	3,23983+ 4	3,09480- 1	28	3	2	1083
3,23992+ 4	3,39100- 1	3,24000+ 4	6,00000- 2	3,24012+ 4	-2,20800- 1	28	3	2	1084
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3,25825+ 4	-3,40000- 3	3,27181+ 4	-1,64000- 2	3,28720+ 4	-2,17000- 2	28	3	2	1089
3,28801+ 4	-2,13000- 2	3,28864+ 4	-2,08000- 2	3,28908+ 4	-1,99000- 2	28	3	2	1090
3,28937+ 4	-1,88000- 2	3,28957+ 4	-1,72000- 2	3,28971+ 4	-1,46000- 2	28	3	2	1091
3,28980+ 4	-1,15000- 2	3,28997+ 4	-1,13250- 2	3,29013+ 4	-3,66000- 2	28	3	2	1092
3,29020+ 4	-3,31000- 2	3,29029+ 4	-2,97000- 2	3,29043+ 4	-2,74000- 2	28	3	2	1093
3,29063+ 4	-2,57000- 2	3,29092+ 4	-2,45000- 2	3,29135+ 4	-2,36000- 2	28	3	2	1094
3,29199+ 4	-2,30000- 2	3,29767+ 4	-2,05000- 2	3,32000+ 4	-2,48000- 2	28	3	2	1095
3,32855+ 4	-3,16000- 2	3,32901+ 4	-3,13000- 2	3,32933+ 4	-3,05900- 2	28	3	2	1096
3,32954+ 4	-2,92000- 2	3,32969+ 4	-2,71000- 2	3,32979+ 4	-2,45000- 2	28	3	2	1097
3,32997+ 4	-2,80680- 2	3,33014+ 4	-4,92000- 2	3,33021+ 4	-4,44000- 2	28	3	2	1098
3,33031+ 4	-4,12000- 2	3,33046+ 4	-3,93000- 2	3,33067+ 4	-3,80000- 2	28	3	2	1099
3,33099+ 4	-3,73000- 2	3,33145+ 4	-3,69000- 2	3,34233+ 4	-3,99000- 2	28	3	2	1100
3,35734+ 4	-3,59000- 2	3,36819+ 4	-3,14000- 2	3,39079+ 4	-2,90000- 2	28	3	2	1101
3,41330+ 4	-3,37000- 2	3,41544+ 4	-3,29100- 2	3,41690+ 4	-3,11200- 2	28	3	2	1102
3,41789+ 4	-2,79700- 2	3,41856+ 4	-2,29000- 2	3,41902+ 4	-1,52000- 2	28	3	2	1103
3,41933+ 4	-4,00010- 3	3,41955+ 4	1,38000- 2	3,41969+ 4	3,81000- 2	28	3	2	1104
3,41979+ 4	6,34000- 2	3,41985+ 4	7,42690- 2	3,41990+ 4	8,51000- 2	28	3	2	1105
3,41997+ 4	2,02350- 1	3,42005+ 4	-2,51800- 1	3,42009+ 4	-2,18270- 1	28	3	2	1106
3,42014+ 4	-1,84800- 1	3,42021+ 4	-1,50100- 1	3,42031+ 4	-1,14300- 1	28	3	2	1107
3,42045+ 4	-9,22000- 2	3,42067+ 4	-7,76000- 2	3,42098+ 4	-6,59000- 2	28	3	2	1108
3,42144+ 4	-5,84000- 2	3,42211+ 4	-5,33000- 2	3,42310+ 4	-5,02200- 2	28	3	2	1109
3,42456+ 4	-4,84800- 2	3,42670+ 4	-4,79700- [illegible]	3,47277+ 4	-7,45800- 2	28	3	2	1110
3,57320+ 4	-1,39560- 1	3,58592+ 4	-1,46650- 1	3,59962+ 4	-1,52220- 1	28	3	2	1111
3,60294+ 4	-1,51980- 1	3,60519+ 4	-1,50070- 1	3,60673+ 4	-1,46200- 1	28	3	2	1112
3,60777+ 4	-1,39780- 1	3,60848+ 4	-1,29970- 1	3,60897+ 4	-1,15010- 1	28	3	2	1113
3,60930+ 4	-9,37200- 2	3,60952+ 4	-6,76000- 2	3,60967+ 4	-1,69000- 2	28	3	2	1114
3,60978+ 4	4,01000- 2	3,60985+ 4	7,96000- 2	3,60996+ 4	1,28910- 1	28	3	2	1115
3,61007+ 4	-3,50100- 1	3,61015+ 4	-3,63900- 1	3,61022+ 4	-3,22700- 1	28	3	2	1116
3,61033+ 4	-2,89600- 1	3,61048+ 4	-2,63800- 1	3,61070+ 4	-2,30520- 1	28	3	2	1117
3,61103+ 4	-2,09800- 1	3,61152+ 4	-1,95620- 1	3,61223+ 4	-1,86090- 1	28	3	2	1118
3,61327+ 4	-1,79830- 1	3,61481+ 4	-1,76010- 1	3,61706+ 4	-1,74090- 1	28	3	2	1119
3,62038+ 4	-1,73800- 1	3,64970+ 4	-1,86950- 1	3,72174+ 4	-2,24340- 1	28	3	2	1120
3,83724+ 4	-2,77890- 1	3,93935+ 4	-3,22540- 1	3,93956+ 4	-3,20680- 1	28	3	2	1121
3,93970+ 4	-3,18210- 1	3,93980+ 4	-3,14340- 1	3,93985+ 4	-3,12130- 1	28	3	2	1122
3,93991+ 4	-3,09920- 1	3,94002+ 4	-3,37350- 1	3,94014+ 4	-3,42790- 1	28	3	2	1123
3,94020+ 4	-3,39390- 1	3,94030+ 4	-3,36300- 1	3,94044+ 4	-3,33430- 1	28	3	2	1124
3,94205+ 4	-3,29300- 1	4,03842+ 4	-3,69480- 1	4,09283+ 4	-3,93230- 1	28	3	2	1125
4,12680+ 4	-4,09820- 1	4,18037+ 4	-4,40880- 1	4,22112+ 4	-4,75370- 1	28	3	2	1126
4,24886+ 4	-5,16290- 1	4,26774+ 4	-5,71020- 1	4,28060+ 4	-6,49150- 1	28	3	2	1127
4,28935+ 4	-7,62510- 1	4,29530+ 4	-9,20130- 1	4,29936+ 4	-1,11060+ 0	28	3	2	1128
4,30212+ 4	-1,27490+ 0	4,30399+ 4	-1,32500+ 0	4,30527+ 4	-1,24660+ 0	28	3	2	1129
4,30614+ 4	-1,13520+ 0	4,30600+ 4	-9,61100- 1	4,30986+ 4	-8,85200- 1	28	3	2	1130
4,31073+ 4	-7,69400- 1	4,31388+ 4	-3,73600- 1	4,31664+ 4	-2,50000- 1	28	3	2	1131
4,32070+ 4	-2,21400- 1	4,32665+ 4	-2,47520- 1	4,33540+ 4	-2,91700- 1	28	3	2	1132
4,34826+ 4	-3,35690- 1	4,36714+ 4	-3,73910- 1	4,39488+ 4	-4,06560- 1	28	3	2	1133
4,43563+ 4	-4,36030- 1	4,49549+ 4	-4,65440- 1	4,60023+ 4	-5,03650- 1	28	3	2	1134
4,73903+ 4	-5,35400- 1	4,73955+ 4	-5,26760- 1	4,73970+ 4	-5,19980- 1	28	3	2	1135
4,73979+ 4	-5,10010- 1	4,73985+ 4	-5,08080- 1	4,73990+ 4	-5,06150- 1	28	3	2	1136
4,73997+ 4	-5,35260- 1	4,74004+ 4	-5,65880- 1	4,74014+ 4	-5,85900- 1	28	3	2	1137
4,74021+ 4	-5,72480- 1	4,74030+ 4	-5,67160- 1	4,74045+ 4	-5,60550- 1	28	3	2	1138
4,74142+ 4	-5,49500- 1	4,74450+ 4	-5,46370- 1	4,77872+ 4	-5,43630- 1	28	3	2	1139

4,78232+	4-5,37900- 1	4,78477+	4-5,28720- 1	4,78644+	4-5,14780- 1	28	3	2	1140
4,78758+	4-4,94180- 1	4,78835+	4-4,64260- 1	4,78888+	4-4,21550- 1	28	3	2	1141
4,78924+	4-3,61860- 1	4,78948+	4-2,93800- 1	4,78965+	4-2,26300- 1	28	3	2	1142
4,78984+	4-2,13000- 1	4,78989+	4-2,16900- 1	4,79000+	4-5,29100- 1	28	3	2	1143
4,79011+	4-7,47700- 1	4,79016+	4-8,51100- 1	4,79035+	4-8,55100- 1	28	3	2	1144
4,79052+	4-8,06900- 1	4,79076+	4-7,46370- 1	4,79112+	4-6,96540- 1	28	3	2	1145
4,79165+	4-6,56480- 1	4,79242+	4-6,27140- 1	4,79356+	4-6,06740- 1	28	3	2	1146
4,79523+	4-5,92960- 1	4,79768+	4-5,83890- 1	4,80657+	4-5,75110- 1	28	3	2	1147
4,81434+	4-5,74100- 1	4,95947+	4-5,96520- 1	4,95964+	4-5,95100- 1	28	3	2	1148
4,95975+	4-5,90980- 1	4,95983+	4-5,85630- 1	4,95997+	4-5,91680- 1	28	3	2	1149
4,96011+	4-6,32860- 1	4,96017+	4-6,29010- 1	4,96025+	4-6,22120- 1	28	3	2	1150
4,96036+	4-6,16820- 1	4,96053+	4-6,13650- 1	4,96115+	4-6,09810- 1	28	3	2	1151
4,96169+	4-6,08840- 1	5,14951+	4-5,98230- 1	5,14967+	4-5,94610- 1	28	3	2	1152
5,14977+	4-5,89610- 1	5,14996+	4-5,86810- 1	5,15015+	4-6,30910- 1	28	3	2	1153
5,15023+	4-6,24230- 1	5,15033+	4-6,18730- 1	5,15049+	4-6,14770- 1	28	3	2	1154
5,15105+	4-6,10230- 1	5,15155+	4-6,06970- 1	5,30367+	4-5,94170- 1	28	3	2	1155
5,34463+	4-5,83850- 1	5,35592+	4-5,75910- 1	5,36361+	4-5,65330- 1	28	3	2	1156
5,37241+	4-5,42960- 1	5,37483+	4-5,40480- 1	5,37761+	4-5,53610- 1	28	3	2	1157
5,38000+	4-5,65830- 1	5,38240+	4-5,69640- 1	5,38759+	4-6,04720- 1	28	3	2	1158
5,39116+	4-6,12840- 1	5,47792+	4-5,90360- 1	5,47904+	4-5,80550- 1	28	3	2	1159
5,47934+	4-5,72140- 1	5,47955+	4-5,59780- 1	5,47970+	4-5,43080- 1	28	3	2	1160
5,47979+	4-5,20500- 1	5,47985+	4-4,92910- 1	5,47990+	4-4,65460- 1	28	3	2	1161
5,47997+	4-5,11200- 1	5,48004+	4-7,60990- 1	5,48014+	4-6,97250- 1	28	3	2	1162
5,48021+	4-6,74840- 1	5,48030+	4-6,53630- 1	5,48045+	4-6,36580- 1	28	3	2	1163
5,48066+	4-6,25090- 1	5,48142+	4-6,10910- 1	5,48306+	4-6,04170- 1	28	3	2	1164
5,50164+	4-5,97950- 1	5,62876+	4-5,83720- 1	5,62942+	4-5,74720- 1	28	3	2	1165
5,62961+	4-5,67800- 1	5,62973+	4-5,59110- 1	5,62982+	4-5,50110- 1	28	3	2	1166
5,62997+	4-5,66550- 1	5,63012+	4-6,53350- 1	5,63018+	4-6,38860- 1	28	3	2	1167
5,63027+	4-6,26520- 1	5,63039+	4-6,16250- 1	5,63057+	4-6,08530- 1	28	3	2	1168
5,63084+	4-6,03370- 1	5,63268+	4-5,95280- 1	5,68953+	4-5,81970- 1	28	3	2	1169
5,68968+	4-5,78210- 1	5,68978+	4-5,73100- 1	5,68997+	4-5,77510- 1	28	3	2	1170
5,69015+	4-6,12180- 1	5,69022+	4-6,06600- 1	5,69032+	4-6,01470- 1	28	3	2	1171
5,69047+	4-5,98010- 1	5,69148+	4-5,92490- 1	5,91933+	4-5,77390- 1	28	3	2	1172
5,99231+	4-5,62890- 1	6,05448+	4-5,47070- 1	6,11287+	4-4,90160- 1	28	3	2	1173
6,16623+	4-4,23540- 1	6,20256+	4-3,70500- 1	6,23674+	4-3,25000- 1	28	3	2	1174
6,28000+	4-2,81900- 1	6,33037+	4-2,38200- 1	6,39411+	4-1,77600- 1	28	3	2	1175
6,43750+	4-1,31600- 1	6,46703+	4-8,16000- 2	6,48714+	4-2,32000- 2	28	3	2	1176
6,50082+	4 2,76000- 2	6,51014+	4 4,43000- 2	6,52080+	4-1,21000- 2	28	3	2	1177
6,52552+	4-5,11000- 2	6,53000+	4-6,61000- 2	6,53920+	4-7,72000- 2	28	3	2	1178
6,54986+	4-1,80100- 1	6,55918+	4-2,57000- 1	6,57286+	4-3,05900- 1	28	3	2	1179
6,59297+	4-3,28700- 1	6,62250+	4-3,30500- 1	6,73752+	4-3,27900- 1	28	3	2	1180
6,80984+	4-3,38100- 1	7,05836+	4-3,43200- 1	7,12902+	4-3,38900- 1	28	3	2	1181
7,12955+	4-3,34400- 1	7,12969+	4-3,30700- 1	7,12979+	4-3,25200- 1	28	3	2	1182
7,12997+	4-3,60230- 1	7,13014+	4-3,66800- 1	7,13021+	4-3,60100- 1	28	3	2	1183
7,13031+	4-3,55100- 1	7,13045+	4-3,51200- 1	7,13143+	4-3,45500- 1	28	3	2	1184
7,16288+	4-3,42430- 1	7,53919+	4-3,25560- 1	7,58694+	4-3,15770- 1	28	3	2	1185
7,59395+	4-3,17100- 1	7,59588+	4-3,19630- 1	7,60000+	4-3,27060- 1	28	3	2	1186
7,60889+	4-3,33000- 1	7,70343+	4-3,20080- 1	7,95977+	4-2,96820- 1	28	3	2	1187
7,97576+	4-2,95150- 1	8,20436+	4-2,64940- 1	8,32579+	4-2,41730- 1	28	3	2	1188
8,38283+	4-2,27340- 1	8,54122+	4-1,53430- 1	8,57014+	4-1,24600- 1	28	3	2	1189
8,59191+	4-9,37200- 2	8,62642+	4-1,05800- 2	8,64992+	4 1,02640- 1	28	3	2	1190
8,66591+	4 2,45320- 1	8,67679+	4 3,68260- 1	8,68420+	4 4,20210- 1	28	3	2	1191
8,68925+	4 3,88110- 1	8,69268+	4 3,22720- 1	8,70000+	4 2,12700- 1	28	3	2	1192
8,70732+	4 2,02500- 1	8,71075+	4 1,28500- 1	8,72321+	4-1,98610- 1	28	3	2	1193
8,73409+	4-3,14840- 1	8,74765+	4-3,49390- 1	8,75008+	4-3,50400- 1	28	3	2	1194
8,77358+	4-3,36290- 1	8,80809+	4-3,02450- 1	8,85878+	4-2,62380- 1	28	3	2	1195
8,87642+	4-2,50670- 1	8,94029+	4-2,12680- 1	9,04267+	4-1,53340- 1	28	3	2	1196
9,10401+	4-1,12910- 1	9,16804+	4-5,12700- 2	9,20339+	4-4,09100- 2	28	3	2	1197
9,27241+	4-2,27400- 2	9,29718+	4-3,45300- 2	9,34277+	4-5,24400- 2	28	3	2	1198
9,35000+	4-5,05100- 2	9,40282+	4-3,17100- 2	9,42759+	4-5,03400- 2	28	3	2	1199

9.50792+ 4	-1.39780- 1	9.51745+ 4	-1.45360- 1	9.59735+ 4	-1.46590- 1	28	3	2	1200
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9.74894+ 4	6.45300- 2	9.75550+ 4	6.61400- 2	9.78440+ 4	2.09000- 1	28	3	2	1202
9.80854+ 4	3.43450- 1	9.82497+ 4	4.09660- 1	9.83615+ 4	3.90380- 1	28	3	2	1203
9.84377+ 4	3.33310- 1	9.86000+ 4	2.34360- 1	9.87623+ 4	2.41450- 1	28	3	2	1204
9.88086+ 4	2.05930- 1	9.89503+ 4	2.30700- 2	9.90508+ 4	-9.97500- 2	28	3	2	1205
9.91146+ 4	-1.60440- 1	9.93560+ 4	-2.86630- 1	9.95111+ 4	-3.16040- 1	28	3	2	1206
9.97106+ 4	-3.27810- 1	1.00000+ 5	-3.11070- 1	1.00000+ 5	5.99135+ 0	28	3	2	1207
.10100E 06	.58364E 01	.10200E 06	.49315E 01	.10370E 06	.39636E 01	28	3	2	1208
.10400E 06	.33107E 01	.10600E 06	.31661E 01	.10650E 06	.30325E 01	28	3	2	1209
.10670E 06	.30182E 01	.10700E 06	.30016E 01	.10720E 06	.42415E 01	28	3	2	1210
.10870E 06	.13520E 02	.10910E 06	.16004E 02	.11000E 06	.17267E 02	28	3	2	1211
.11010E 06	.16049E 02	.11070E 06	.12805E 02	.11100E 06	.11175E 02	28	3	2	1212
.11170E 06	.85104E 01	.11200E 06	.73728E 01	.11300E 06	.63606E 01	28	3	2	1213
.11400E 06	.57885E 01	.11470E 06	.54790E 01	.11570E 06	.50312E 01	28	3	2	1214
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.12000E 06	.35647E 01	.12020E 06	.35110E 01	.12120E 06	.32421E 01	28	3	2	1216
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.12400E 06	.36747E 01	.12420E 06	.39341E 01	.12500E 06	.49683E 01	28	3	2	1218
.12520E 06	.53669E 01	.12550E 06	.59692E 01	.12600E 06	.50230E 01	28	3	2	1219
.12700E 06	.40607E 01	.12720E 06	.39769E 01	.12820E 06	.35609E 01	28	3	2	1220
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.13300E 06	.19344E 01	.13320E 06	.19341E 01	.13500E 06	.19235E 01	28	3	2	1222
.13520E 06	.19643E 01	.13600E 06	.21343E 01	.13620E 06	.22988E 01	28	3	2	1223
.13720E 06	.31112E 01	.13800E 06	.37663E 01	.13820E 06	.40661E 01	28	3	2	1224
.13970E 06	.63248E 01	.14000E 06	.67724E 01	.14020E 06	.69727E 01	28	3	2	1225
.14100E 06	.77327E 01	.14200E 06	.79752E 01	.14300E 06	.12578E 02	28	3	2	1226
.14350E 06	.11579E 02	.14420E 06	.10461E 02	.14500E 06	.91781E 01	28	3	2	1227
.14620E 06	.76143E 01	.14700E 06	.65773E 01	.14920E 06	.51188E 01	28	3	2	1228
.15000E 06	.45815E 01	.15020E 06	.44736E 01	.15300E 06	.29949E 01	28	3	2	1229
.15320E 06	.28759E 01	.15400E 06	.23945E 01	.15500E 06	.21927E 01	28	3	2	1230
.15600E 06	.31910E 01	.15670E 06	.54998E 01	.15700E 06	.64895E 01	28	3	2	1231
.15800E 06	.86865E 01	.15870E 06	.92476E 01	.15900E 06	.94863E 01	28	3	2	1232
.16000E 06	.93312E 01	.16070E 06	.89577E 01	.16200E 06	.81711E 01	28	3	2	1233
.16270E 06	.77475E 01	.16400E 06	.69772E 01	.16570E 06	.61398E 01	28	3	2	1234
.16600E 06	.59893E 01	.16770E 06	.53154E 01	.16800E 06	.51953E 01	28	3	2	1235
.16900E 06	.51798E 01	.17000E 06	.54544E 01	.17100E 06	.57344E 01	28	3	2	1236
.17200E 06	.55744E 01	.17500E 06	.47600E 01	.18000E 06	.35895E 01	28	3	2	1237
.18300E 06	.43555E 01	.18380E 06	.27733E 01	.18440E 06	.44661E 01	28	3	2	1238
.18650E 06	.32444E 01	.18740E 06	.47551E 01	.18860E 06	.36008E 01	28	3	2	1239
.19000E 06	.35396E 01	.19010E 06	.35353E 01	.19080E 06	.39382E 01	28	3	2	1240
.19220E 06	.11586E 02	.19260E 06	.11756E 02	.19360E 06	.84699E 01	28	3	2	1241
.19510E 06	.40307E 01	.19580E 06	.35916E 01	.19670E 06	.40725E 01	28	3	2	1242
.19750E 06	.56914E 01	.19800E 06	.64513E 01	.19810E 06	.66034E 01	28	3	2	1243
.19900E 06	.48318E 01	.20280E 06	.23487E 01	.20490E 06	.44727E 01	28	3	2	1244
.20500E 06	.47817E 01	.20600E 06	.78716E 01	.20650E 06	.94163E 01	28	3	2	1245
.20730E 06	.13499E 02	.20800E 06	.96953E 01	.20970E 06	.10309E 02	28	3	2	1246
.21000E 06	.10260E 02	.21160E 06	.99993E 01	.21480E 06	.77032E 01	28	3	2	1247
.21560E 06	.82952E 01	.21600E 06	.89116E 01	.21650E 06	.96803E 01	28	3	2	1248
.21750E 06	.70090E 01	.21950E 06	.56474E 01	.22000E 06	.63514E 01	28	3	2	1249
.22070E 06	.73378E 01	.22160E 06	.52715E 01	.22400E 06	.40104E 01	28	3	2	1250
.22500E 06	.34833E 01	.22560E 06	.31672E 01	.22830E 06	.15051E 01	28	3	2	1251
.23010E 06	.18267E 01	.23200E 06	.44966E 01	.23260E 06	.53406E 01	28	3	2	1252
.23450E 06	.97331E 01	.23650E 06	.93745E 01	.24000E 06	.73301E 01	28	3	2	1253
.24080E 06	.66614E 01	.24260E 06	.72718E 01	.24410E 06	.57014E 01	28	3	2	1254
.24600E 06	.70376E 01	.24710E 06	.61327E 01	.24770E 06	.62662E 01	28	3	2	1255
.25100E 06	.44144E 01	.25200E 06	.42615E 01	.25470E 06	.36444E 01	28	3	2	1256
.25500E 06	.41848E 01	.25620E 06	.55464E 01	.25700E 06	.40238E 01	28	3	2	1257
.25790E 06	.63542E 01	.25800E 06	.63788E 01	.25870E 06	.65525E 01	28	3	2	1258
.26200E 06	.46842E 01	.26460E 06	.34005E 01	.26590E 06	.33902E 01	28	3	2	1259

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.27130E	06	.22806E	01	.27200E	06	.38903E	01	.27340E	06	.72918E	01	28	3	2 1262
.27440E	06	.62579E	01	.27500E	06	.79049E	01	.27560E	06	.75769E	01	28	3	2 1263
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.30960E	06	.33479E	01	.31060E	06	.45261E	01	.31140E	06	.40223E	01	28	3	2 1273
.31240E	06	.43815E	01	.31430E	06	.35008E	01	.31450E	06	.32359E	01	28	3	2 1274
.31500E	06	.32979E	01	.31530E	06	.31910E	01	.31720E	06	.49621E	01	28	3	2 1275
.31860E	06	.42542E	01	.32120E	06	.28933E	01	.32350E	06	.13165E	01	28	3	2 1276
.32480E	06	.17725E	01	.32610E	06	.56826E	01	.32660E	06	.67316E	01	28	3	2 1277
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.34170E	06	.45246E	01	.34290E	06	.55916E	01	.34470E	06	.44138E	01	28	3	2 1282
.34590E	06	.43643E	01	.34630E	06	.39679E	01	.34740E	06	.26185E	01	28	3	2 1283
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.36120E	06	.49732E	01	.36220E	06	.41492E	01	.36450E	06	.42781E	01	28	3	2 1287
.36650E	06	.33606E	01	.36840E	06	.35543E	01	.37000E	06	.34711E	01	28	3	2 1288
.37130E	06	.34042E	01	.37240E	06	.32553E	01	.37450E	06	.27689E	01	28	3	2 1289
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.45000E	06	.48291E	01	.45160E	06	.44439E	01	.45270E	06	.30268E	01	28	3	2 1308
.45370E	06	.20358E	01	.45440E	06	.22608E	01	.45660E	06	.61127E	01	28	3	2 1309
.45730E	06	.60227E	01	.45840E	06	.51106E	01	.45910E	06	.60546E	01	28	3	2 1310
.46060E	06	.45685E	01	.46130E	06	.27435E	01	.46210E	06	.33745E	01	28	3	2 1311
.46320E	06	.59764E	01	.46460E	06	.53104E	01	.46650E	06	.45563E	01	28	3	2 1312
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.49210E	06	.41354E	01	.49330E	06	.38493E	01	.49490E	06	.17063E	01	28	3	2 1318
.49570E	06	.21072E	01	.49660E	06	.48282E	01	.49820E	06	.45021E	01	28	3	2 1319

.49900E	06	.47361E	01	.49[illegible]0E	06	.40691E	01	.50010E	06	.42171E	01	28	3	2 1320
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.50720E	06	.31466E	01	.50790E	06	.51708E	01	.50820E	06	.53968E	01	28	3	2 1323
.50870E	06	.54568E	01	.50890E	06	.57768E	01	.50930E	06	.48767E	01	28	3	2 1324
.50960E	06	.43567E	01	.51010E	06	.45747E	01	.51030E	06	.48567E	01	28	3	2 1325
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.51240E	06	.47466E	01	.51310E	06	.59766E	01	.51370E	06	.45566E	01	28	3	2 1327
.51470E	06	.35569E	01	.514[illegible]0E	06	.35269E	01	.51560E	06	.38969E	01	28	3	2 1328
.51600E	06	.45669E	01	.51630E	06	.41469E	01	.51690E	06	.37469E	01	28	3	2 1329
.51740E	06	.34569E	01	.51[illegible]0E	06	.38369E	01	.51850E	06	.33370E	01	28	3	2 1330
.51920E	06	.25470E	01	.51960E	06	.24170E	01	.52050E	06	.24670E	01	28	3	2 1331
.52140E	06	.25571E	01	.52210E	06	.22071E	01	.52250E	06	.23471E	01	28	3	2 1332
.52320E	06	.54371E	01	.52[illegible]0E	06	.50371E	01	.52430E	06	.53871E	01	28	3	2 1333
.52490E	06	.48472E	01	.52540E	06	.40372E	01	.52630E	06	.34672E	01	28	3	2 1334
.52690E	06	.34772E	01	.52760E	06	.42372E	01	.52780E	06	.47372E	01	28	3	2 1335
.52840E	06	.45573E	01	.52910E	06	.47673E	01	.52990E	06	.51973E	01	28	3	2 1336
.53060E	06	.51466E	01	.53150E	06	.44673E	01	.53210E	06	.41374E	01	28	3	2 1337
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.53720E	06	.35175E	01	.537[illegible]0E	06	.36575E	01	.53850E	06	.36776E	01	28	3	2 1339
.53970E	06	.31176E	01	.54020E	06	.26276E	01	.54080E	06	.30076E	01	28	3	2 1340
.54120E	06	.35676E	01	.54160E	06	.45877E	01	.54250E	06	.39377E	01	28	3	2 1341
.54350E	06	.34777E	01	.54490E	06	.31477E	01	.54700E	06	.27178E	01	28	3	2 1342
.54900E	06	.24979E	01	.549[illegible]0E	06	.23979E	01	.55070E	06	.26679E	01	28	3	2 1343
.55130E	06	.20379E	01	.55250E	06	.24680E	01	.55310E	06	.29980E	01	28	3	2 1344
.55370E	06	.4[illegible]280E	01	.55410E	06	.48180E	01	.55470E	06	.51580E	01	28	3	2 1345
.55510E	06	.44981E	01	.55590E	06	.[illegible]4581E	01	.55650E	06	.29481E	01	28	3	2 1346
.55730E	06	.23581E	01	.55810E	06	.[illegible]9581E	01	.55870E	06	.19482E	01	28	3	2 1347
.55910E	06	.25282E	01	.559[illegible]0E	06	.34682E	01	.55990E	06	.41282E	01	28	3	2 1348
.56030E	06	.42882E	01	.56090E	06	.31482E	01	.56150E	06	.24282E	01	28	3	2 1349
.56200E	06	.16663E	01	.56350E	06	.17183E	01	.56460E	06	.17183E	01	28	3	2 1350
.56580E	06	.13684E	01	.56710E	06	.25384E	01	.56770E	06	.39984E	01	28	3	2 1351
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.57250E	06	.45[illegible]6E	01	.57310E	06	.45786E	01	.57370E	06	.46586E	01	28	3	2 1353
.57430E	06	.45366E	01	.575[illegible]0E	06	.50366E	01	.57540E	06	.57387E	01	28	3	2 1354
.57560E	06	.58967E	01	.57600E	06	.51587E	01	.57670E	06	.45687E	01	28	3	2 1355
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.58310E	06	.30089E	01	.58390E	06	.25089E	01	.58460E	06	.25789E	01	28	3	2 1359
.58560E	06	.26489E	01	.585[illegible]0E	06	.2189[illegible]E	01	.58610E	06	.18890E	01	28	3	2 1360
.58670E	06	.19090E	01	.58740E	06	.2249[illegible]E	01	.58800E	06	.19190E	01	28	3	2 1361
.58870E	06	.23790E	01	.58930E	06	.33691E	01	.59000E	06	.40791E	01	28	3	2 1362
.59040E	06	.41391E	01	.59110E	06	.34091E	01	.59150E	06	.35691E	01	28	3	2 1363
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.60060E	06	.25594E	01	.60110E	06	.33794E	01	.60130E	06	.35894E	01	28	3	2 1368
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.60360E	06	.49394E	01	.60420E	06	.52094E	01	.60510E	06	.42794E	01	28	3	2 1370
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.68170E	06	.46296E	01	.68250E	06	.38596E	01	.68330E	06	.41796E	01	28 3	2 1406
.68430E	06	.43096E	01	.68520E	06	.39997E	01	.68600E	06	.39697E	01	28 3	2 1407
.68690E	06	.39397E	01	.68770E	06	.35697E	01	.68850E	06	.34097E	01	28 3	2 1408
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.69050E	06	.50597E	01	.69130E	06	.43497E	01	.69180E	06	.40397E	01	28 3	2 1410
.69240E	06	.39997E	01	.69300E	06	.40697E	01	.69380E	06	.29[illegible]97E	01	28 3	2 1411
.69430E	06	.25497E	01	.69490E	06	.27397E	01	.69570E	06	.37397E	01	28 3	2 1412
.69600E	06	.40397E	01	.69660E	06	.32897E	01	.69740E	06	.21997E	01	28 3	2 1413
.69800E	06	.20397E	01	.69860E	06	.19497E	01	.69910E	06	.24897E	01	28 3	2 1414
.69970E	06	.37397E	01	.70000E	06	.39197E	01	.70080E	06	.43497E	01	28 3	2 1415
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.70450E	06	.36897E	01	.70540E	06	.34997E	01	.70620E	06	.39997E	01	28 3	2 1417
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.73120E	06	.25597E	01	.73180E	06	.25897E	01	.73240E	06	.21397E	01	28 3	2 1427
.73300E	06	.22497E	01	.73360E	06	.28397E	01	.73420E	06	.27897E	01	28 3	2 1428
.73520E	06	.14397E	01	.73640E	06	.11497E	01	.73730E	06	.15997E	01	28 3	2 1429
.73790E	06	.19397E	01	.73910E	06	.30197E	01	.73970E	06	.26597E	01	28 3	2 1430
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.75600E	06	.30298E	01	.75720E	06	.40498E	01	.75760E	06	.39198E	01	28 3	2 1439

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.83860E	06	.35195E	01	.83940E	06	.27695E	01	.84050E	06	.31195E	01	28 3	2 1466
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.84910E	06	.44495E	01	.85000E	06	.33613E	01	.85020E	06	.31195E	01	28 3	2 1470
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.85790E	06	.22894E	01	.85940E	06	.19294E	01	.86130E	06	.18894E	01	28 3	2 1473
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.86790E	06	.21993E	01	.86370E	06	.22393E	01	.86950E	06	.25693E	01	28 3	2 1476
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.87420E	06	.31093E	01	.87540E	06	.32793E	01	.87770E	06	.33692E	01	28 3	2 1478
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.88090E	06	.24192E	01	.88170E	06	.19892E	01	.88210E	06	.18692E	01	28 3	2 1480
.88250E	06	.20892E	01	.88290E	06	.24792E	01	.88370E	06	.34692E	01	28 3	2 1481
.88410E	06	.34992E	01	.88530E	06	.28492E	01	.88610E	06	.27092E	01	28 3	2 1482
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.88900E	06	.42992E	01	.88980E	06	.49891E	01	.89020E	06	.53591E	01	28 3	2 1484
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.89670E	06	.34691E	01	.89750E	06	.32091E	01	.89830E	06	.34391E	01	28 3	2 1487
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.98700E	06	.25983E	01	.98800E	06	.27582E	01	.98940E	06	.34682E	01	28 3	2 1512
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.12730E	07	.27557E	01	.12800E	07	.35055E	01	.12810E	07	.36753E	01	28 3	2 1558
.12840E	07	.36250E	01	.12850E	07	.37262E	01	.12870E	07	.35747E	01	28 3	2 1559

.12590E	07	.42945E	01	.12910E	07	.48143E	01	.12930E	07	.50240E	01	28	3	2	1560
.12950E	07	.46338E	01	.12960E	07	.40337E	01	.12990E	07	.30434E	01	28	3	2	1561
.13000E	07	.33033E	01	.13020E	07	.34950E	01	.13050E	07	.33727E	01	28	3	2	1562
.13030E	07	.32723E	01	.13110E	07	.34620E	01	.13140E	07	.37616E	01	28	3	2	1563
.13160E	07	.43514E	01	.13190E	07	.44010E	01	.13210E	07	.35508E	01	28	3	2	1564
.13230E	07	.31506E	01	.13260E	07	.36952E	01	.13280E	07	.35100E	01	28	3	2	1565
.13290E	07	.35599E	01	.13300E	07	.39497E	01	.13320E	07	.42595E	01	28	3	2	1566
.13350E	07	.34391E	01	.13360E	07	.32256E	01	.13390E	07	.32254E	01	28	3	2	1567
.13400E	07	.32219E	01	.13410E	07	.32154E	01	.13440E	07	.39980E	01	28	3	2	1568
.13450E	07	.42579E	01	.13470E	07	.41676E	01	.13490E	07	.46773E	01	28	3	2	1569
.13530E	07	.43668E	01	.13550E	07	.37532E	01	.13560E	07	.34446E	01	28	3	2	1570
.13590E	07	.27697E	01	.13600E	07	.26705E	01	.13630E	07	.23728E	01	28	3	2	1571
.13650E	07	.21494E	01	.13670E	07	.25060E	01	.13690E	07	.33126E	01	28	3	2	1572
.13700E	07	.37709E	01	.13720E	07	.34573E	01	.13740E	07	.37941E	01	28	3	2	1573
.13750E	07	.36524E	01	.13780E	07	.35873E	01	.13810E	07	.37122E	01	28	3	2	1574
.13840E	07	.35170E	01	.13860E	07	.27636E	01	.13880E	07	.27102E	01	28	3	2	1575
.13890E	07	.31365E	01	.13910E	07	.32051E	01	.13940E	07	.21766E	01	28	3	2	1576
.13960E	07	.25132E	01	.13990E	07	.27115E	01	.14000E	07	.29198E	01	28	3	2	1577
.14020E	07	.3[illegible]276E	01	.14050E	07	.25043E	01	.14060E	07	.25032E	01	28	3	2	1578
.14080E	07	.33910E	01	.14120E	07	.31866E	01	.14140E	07	.29744E	01	28	3	2	1579
.14160E	07	.28022E	01	.14190E	07	.31689E	01	.14200E	07	.30578E	01	28	3	2	1580
.14230E	07	.34545E	01	.14250E	07	.38623E	01	.14270E	07	.33601E	01	28	3	2	1581
.14290E	07	.32579E	01	.14320E	07	.40746E	01	.14330E	07	.40635E	01	28	3	2	1582
.14360E	07	.33303E	01	.14400E	07	.31259E	01	.14420E	07	.26837E	01	28	3	2	1583
.14440E	07	.25415E	01	.14460E	07	.30371E	01	.14500E	07	.34649E	01	28	3	2	1584
.14520E	07	.33739E	01	.14550E	07	.30423E	01	.14560E	07	.29918E	01	28	3	2	1585
.14600E	07	.39697E	01	.14650E	07	.39671E	01	.14670E	07	.38161E	01	28	3	2	1586
.14710E	07	.40240E	01	.14750E	07	.29620E	01	.14780E	07	.29604E	01	28	3	2	1587
.14790E	07	.32699E	01	.14800E	07	.35722E	01	.14810E	07	.35646E	01	28	3	2	1588
.14830E	07	.33992E	01	.14850E	07	.28739E	01	.14870E	07	.28266E	01	28	3	2	1589
.14920E	07	.30905E	01	.14940E	07	.30550E	01	.15000E	07	.36861E	01	28	3	2	1590
.15010E	07	.37998E	01	.15040E	07	.34321E	01	.15070E	07	.28244E	01	28	3	2	1591
.15100E	07	.21466E	01	.15110E	07	.21874E	01	.15160E	07	.32912E	01	28	3	2	1592
.15170E	07	.33620E	01	.15260E	07	.24888E	01	.15290E	07	.29511E	01	28	3	2	1593
.15320E	07	.29634E	01	.15360E	07	.24860E	01	.15420E	07	.24110E	01	28	3	2	1594
.15460E	07	.31341E	01	.15480E	07	.35456E	01	.15490E	07	.35463E	01	28	3	2	1595
.15500E	07	.32671E	01	.15520E	07	.27062E	01	.15560E	07	.25442E	01	28	3	2	1596
.15560E	07	.26733E	01	.15600E	07	.33023E	01	.15620E	07	.31814E	01	28	3	2	1597
.15640E	07	.25704E	01	.15660E	07	.29495E	01	.15690E	07	.31980E	01	28	3	2	1598
.15730E	07	.27161E	01	.15770E	07	.29542E	01	.15790E	07	.28132E	01	28	3	2	1599
.15820E	07	.36118E	01	.15840E	07	.29969E	01	.15890E	07	.27385E	01	28	3	2	1600
.15920E	07	.21270E	01	.15960E	07	.18151E	01	.15990E	07	.20437E	01	28	3	2	1601
.16000E	07	.21932E	01	.16020E	07	.24667E	01	.16030E	07	.24965E	01	28	3	2	1602
.16050E	07	.25620E	01	.16060E	07	.24397E	01	.16080E	07	.31552E	01	28	3	2	1603
.16100E	07	.40807E	01	.16110E	07	.41764E	01	.16130E	07	.36439E	01	28	3	2	1604
.16160E	07	.32272E	01	.16180E	07	.30227E	01	.16210E	07	.30659E	01	28	3	2	1605
.16240E	07	.25392E	01	.16270E	07	.32124E	01	.16280E	07	.30702E	01	28	3	2	1606
.16310E	07	.23734E	01	.16350E	07	.24444E	01	.16390E	07	.23954E	01	28	3	2	1607
.16410E	07	.24309E	01	.16420E	07	.22967E	01	.16450E	07	.27019E	01	28	3	2	1608
.16460E	07	.27296E	01	.16480E	07	.26051E	01	.16500E	07	.27506E	01	28	3	2	1609
.16520E	07	.27321E	01	.16530E	07	.28526E	01	.16560E	07	.26749E	01	28	3	2	1610
.16590E	07	.25470E	01	.16620E	07	.26391E	01	.16650E	07	.35913E	01	28	3	2	1611
.16670E	07	.37227E	01	.16680E	07	.35434E	01	.16710E	07	.33655E	01	28	3	2	1612
.16720E	07	.33462E	01	.16750E	07	.30784E	01	.16760E	07	.31091E	01	28	3	2	1613
.16800E	07	.25319E	01	.16830E	07	.26640E	01	.16870E	07	.27969E	01	28	3	2	1614
.16890E	07	.25183E	01	.16930E	07	.20911E	01	.16950E	07	.20625E	01	28	3	2	1615
.16970E	07	.22539E	01	.17000E	07	.31361E	01	.17020E	07	.34637E	01	28	3	2	1616
.17040E	07	.37414E	01	.17060E	07	.35190E	01	.17080E	07	.32766E	01	28	3	2	1617
.17100E	07	.33043E	01	.17110E	07	.35531E	01	.17140E	07	.35196E	01	28	3	2	1618
.17170E	07	.32160E	01	.17200E	07	.27625E	01	.17220E	07	.26201E	01	28	3	2	1619

.17240E	07	.25976E	01	.17260E	07	.20434E	01	.17290E	07	.25719E	01	28	3	2	1620
.17320E	07	.23964E	01	.17340E	07	.25960E	01	.17370E	07	.27425E	01	28	3	2	1621
.17400E	07	.25189E	01	.17420E	07	.26506E	01	.17440E	07	.23542E	01	28	3	2	1622
.17460E	07	.25519E	01	.17500E	07	.25571E	01	.17540E	07	.23325E	01	28	3	2	1623
.17550E	07	.25514E	01	.17590E	07	.26667E	01	.17600E	07	.25756E	01	28	3	2	1624
.17630E	07	.21521E	01	.17650E	07	.20346E	01	.17670E	07	.20675E	01	28	3	2	1625
.17690E	07	.23551E	01	.17720E	07	.26117E	01	.17750E	07	.27482E	01	28	3	2	1626
.17770E	07	.25659E	01	.17800E	07	.23224E	01	.17830E	07	.23569E	01	28	3	2	1627
.17860E	07	.22354E	01	.17870E	07	.23043E	01	.17900E	07	.24406E	01	28	3	2	1628
.17930E	07	.34773E	01	.17950E	07	.36050E	01	.17980E	07	.37315E	01	28	3	2	1629
.17990E	07	.38504E	01	.18000E	07	.37592E	01	.18020E	07	.34519E	01	28	3	2	1630
.18050E	07	.34259E	01	.18080E	07	.36699E	01	.18120E	07	.31152E	01	28	3	2	1631
.18150E	07	.27192E	01	.18180E	07	.24652E	01	.18200E	07	.21559E	01	28	3	2	1632
.18220E	07	.23385E	01	.18240E	07	.24312E	01	.18250E	07	.24325E	01	28	3	2	1633
.18280E	07	.21765E	01	.18320E	07	.21519E	01	.18350E	07	.25459E	01	28	3	2	1634
.18380E	07	.24199E	01	.18410E	07	.24939E	01	.18430E	07	.25565E	01	28	3	2	1635
.18450E	07	.29092E	01	.18490E	07	.26145E	01	.18500E	07	.26159E	01	28	3	2	1636
.18520E	07	.26143E	01	.18560E	07	.25813E	01	.18600E	07	.24782E	01	28	3	2	1637
.18610E	07	.24574E	01	.18630E	07	.26559E	01	.18670E	07	.17528E	01	28	3	2	1638
.18720E	07	.17590E	01	.18750E	07	.19067E	01	.18780E	07	.19244E	01	28	3	2	1639
.18820E	07	.23613E	01	.18840E	07	.26593E	01	.18870E	07	.26575E	01	28	3	2	1640
.18880E	07	.26467E	01	.18910E	07	.26244E	01	.18930E	07	.25229E	01	28	3	2	1641
.18960E	07	.25106E	01	.19000E	07	.29555E	01	.19010E	07	.30660E	01	28	3	2	1642
.19030E	07	.29231E	01	.19060E	07	.27467E	01	.19080E	07	.27659E	01	28	3	2	1643
.19100E	07	.28529E	01	.19110E	07	.28514E	01	.19120E	07	.27160E	01	28	3	2	1644
.19150E	07	.25656E	01	.19170E	07	.24127E	01	.19210E	07	.21468E	01	28	3	2	1645
.19240E	07	.20625E	01	.19260E	07	.19395E	01	.19280E	07	.17966E	01	28	3	2	1646
.19300E	07	.18137E	01	.19340E	07	.19979E	01	.19370E	07	.21835E	01	28	3	2	1647
.19410E	07	.26276E	01	.19430E	07	.27747E	01	.19460E	07	.27763E	01	28	3	2	1648
.19470E	07	.27189E	01	.19490E	07	.25660E	01	.19500E	07	.23145E	01	28	3	2	1649
.19510E	07	.20630E	01	.19540E	07	.18067E	01	.19560E	07	.17257E	01	28	3	2	1650
.19590E	07	.19114E	01	.19620E	07	.21173E	01	.19640E	07	.23841E	01	28	3	2	1651
.19660E	07	.23211E	01	.19680E	07	.22792E	01	.19710E	07	.24036E	01	28	3	2	1652
.19740E	07	.26295E	01	.19760E	07	.28465E	01	.19790E	07	.29622E	01	28	3	2	1653
.19820E	07	.25478E	01	.19850E	07	.22834E	01	.19890E	07	.23576E	01	28	3	2	1654
.19910E	07	.24946E	01	.19950E	07	.25068E	01	.19970E	07	.24759E	01	28	3	2	1655
.19990E	07	.23430E	01	.20000E	07	.23565E	01	.20010E	07	.23715E	01	28	3	2	1656
.20050E	07	.22214E	01	.20090E	07	.23914E	01	.20130E	07	.22213E	01	28	3	2	1657
.20170E	07	.24713E	01	.20190E	07	.24512E	01	.20210E	07	.22412E	01	28	3	2	1658
.20270E	07	.25711E	01	.20300E	07	.26011E	01	.20340E	07	.31610E	01	28	3	2	1659
.20400E	07	.28510E	01	.20450E	07	.26009E	01	.20520E	07	.23508E	01	28	3	2	1660
.20550E	07	.25108E	01	.20590E	07	.28067E	01	.20610E	07	.28307E	01	28	3	2	1661
.20670E	07	.26006E	01	.20720E	07	.23205E	01	.20740E	07	.22605E	01	28	3	2	1662
.20780E	07	.23704E	01	.20830E	07	.23203E	01	.20840E	07	.23303E	01	28	3	2	1663
.20900E	07	.23302E	01	.20930E	07	.26401E	01	.20970E	07	.22700E	01	28	3	2	1664
.21000E	07	.21550E	01	.21030E	07	.20399E	01	.21090E	07	.23998E	01	28	3	2	1665
.21130E	07	.22097E	01	.21190E	07	.24596E	01	.21220E	07	.26595E	01	28	3	2	1666
.21300E	07	.30893E	01	.21340E	07	.27992E	01	.21360E	07	.27992E	01	28	3	2	1667
.21400E	07	.30691E	01	.21450E	07	.28390E	01	.21480E	07	.30189E	01	28	3	2	1668
.21520E	07	.23388E	01	.21560E	07	.20186E	01	.21620E	07	.21786E	01	28	3	2	1669
.21740E	07	.23584E	01	.21770E	07	.23263E	01	.21800E	07	.27782E	01	28	3	2	1670
.21820E	07	.29182E	01	.21860E	07	.26461E	01	.21900E	07	.23980E	01	28	3	2	1671
.21950E	07	.24475E	01	.21960E	07	.24554E	01	.22000E	07	.23469E	01	28	3	2	1672
.22020E	07	.22963E	01	.22050E	07	.21552E	01	.22080E	07	.24742E	01	28	3	2	1673
.22150E	07	.21115E	01	.22200E	07	.19802E	01	.22290E	07	.27871E	01	28	3	2	1674
.22320E	07	.28261E	01	.22370E	07	.23944E	01	.22410E	07	.23830E	01	28	3	2	1675
.22490E	07	.25403E	01	.22500E	07	.24900E	01	.22550E	07	.22358E	01	28	3	2	1676
.22580E	07	.24332E	01	.22650E	07	.27373E	01	.22730E	07	.25106E	01	28	3	2	1677
.22620E	07	.21030E	01	.22860E	07	.26779E	01	.22900E	07	.27462E	01	28	3	2	1678
.22930E	07	.25337E	01	.22980E	07	.27794E	01	.23000E	07	.26777E	01	28	3	2	1679

.23030E	07	.24223E	01	[illegible]	07	.27321E	01	.23100E	07	.31996E	01	28	3	2 1680
.23190E	07	.26956E	01	[illegible]	07	.27426E	01	.23240E	07	.22983E	01	28	3	2 1681
.23270E	07	.23491E	01	[illegible]	07	.26297E	01	.23410E	07	.22101E	01	28	3	2 1682
.23490E	07	.27625E	01	[illegible]	07	.28374E	01	.23570E	07	.27029E	01	28	3	2 1683
.23640E	07	.27394E	01	[illegible]	07	.20656E	01	.23780E	07	.19203E	01	28	3	2 1684
.23810E	07	.21771E	01	[illegible]	07	.24507E	01	.23920E	07	.22653E	01	28	3	2 1685
.23910E	07	.25532E	01	[illegible]	07	.20699E	01	.23990E	07	.28076E	01	28	3	2 1686
.24000E	07	.27450E	01	[illegible]	07	.25646E	01	.24100E	07	.24632E	01	28	3	2 1687
.24140E	07	[illegible]	01	[illegible]	07	.19700E	01	.24260E	07	.23076E	01	28	3	2 1688
.24300E	07	.25940E	01	[illegible]	07	.29150E	01	.24480E	07	.24898E	01	28	3	2 1689
.24540E	07	.27477E	01	[illegible]	07	.26565E	01	.24610E	07	.24252E	01	28	3	2 1690
.24690E	07	.25424E	01	[illegible]	07	.22503E	01	.24780E	07	.16992E	01	28	3	2 1691
.24820E	07	.17273E	01	[illegible]	07	.20457E	01	.24920E	07	.25343E	01	28	3	2 1692
[illegible]	07	.20532E	01	[illegible]	07	.24016E	01	.25000E	07	.23565E	01	28	3	2 1693
.25010E	07	[illegible]	01	[illegible]	07	.21653E	01	.25110E	07	.21744E	01	28	3	2 1694
.25150E	07	.22512E	01	[illegible]	07	.22057E	01	.25240E	07	.24561E	01	28	3	2 1695
[illegible]	07	.27450E	01	[illegible]	07	.24197E	01	.25400E	07	.23159E	01	28	3	2 1696
.25440E	07	.22635E	01	[illegible]	07	.24541E	01	.25500E	07	.25393E	01	28	3	2 1697
[illegible]	07	.27549E	01	[illegible]	07	.27112E	01	.25690E	07	.23953E	01	28	3	2 1698
.25770E	07	[illegible]	01	[illegible]	07	.25450E	01	.25910E	07	.22792E	01	28	3	2 1699
.25970E	07	.21940E	01	[illegible]	07	.22340E	01	.26020E	07	.22619E	01	28	3	2 1700
.26030E	07	.26193E	01	[illegible]	07	.27204E	01	.26180E	07	.24463E	01	28	3	2 1701
.26240E	07	.21743E	01	[illegible]	07	.22922E	01	.26360E	07	.20001E	01	28	3	2 1702
.26410E	07	[illegible]	01	.26470E	07	.19965E	01	.26510E	07	.21649E	01	28	3	2 1703
.26550E	07	.25735E	01	[illegible]	07	.22515E	01	.26660E	07	.21797E	01	28	3	2 1704
.26700E	07	[illegible]	01	[illegible]	07	.19773E	01	.26780E	07	.23143E	01	28	3	2 1705
.26920E	07	.24123E	01	[illegible]	07	.22276E	01	.26930E	07	[illegible]	01	28	3	2 1706
.27000E	07	.23755E	01	[illegible]	07	.24224E	01	.27040E	07	.23215E	01	28	3	2 1707
.27050E	07	.17447E	01	[illegible]	07	.18700E	01	.27190E	07	.22946E	01	28	3	2 1708
.27250E	07	.24421E	01	[illegible]	07	.25395E	01	.27360E	07	.23771E	01	28	3	2 1709
.27430E	07	[illegible]	01	[illegible]	07	.25151E	01	.27520E	07	.23599E	01	28	3	2 1710
.27500E	07	.20651E	01	[illegible]	07	.21959E	01	.27690E	07	.27123E	01	28	3	2 1711
.27720E	07	[illegible]	01	[illegible]	07	.23991E	01	.27810E	07	.23469E	01	28	3	2 1712
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.30450E	07	.22620E	01	.30500E	07	.21676E	01	.30560E	07	[illegible]	01	28	3	2 1729
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.31200E	07	.19510E	01	.31230E	07	.19750E	01	.31340E	07	.13597E	01	28	3	2 1732
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.17000E 07	.37760E 00	.175[illegible] 07	.43450E 00	.18000E 07	.49[illegible]40E 00	28	3	4	1834
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.40500E 07	.12551E 01	.425[illegible] 07	.12438E 01	.43000E 07	.12410E 01	28	3	4	1845
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.75000E 07	.99565E 00	.805[illegible] 07	.89130E 00	.90000E 07	.7933[illegible] 00	28	3	4	1847
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.16000E 08	.30[illegible]27E 00	.160[illegible] 08	.16313E 00	.20000E 08	.13600E 00	28	3	4	1849
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.79540E 07	.00000E 00	.10000E 08	.276[illegible]E-02	.11000E 08	.55600E-02	28	3	16	1854
.11500E 08	.6672[illegible]E-02	.1175[illegible] 08	.834[illegible]E-02	.12000E 08	.13900E-01	28	3	16	1855
.12410E 08	.28147E-01	.13000E 08	.51526E-01	.13500E 08	.74677E-01	28	3	16	1856
.14000E 08	.96547E-01	.14500E 08	.11661E 00	.15000E 08	.13435E 00	28	3	16	1857
.15500E 08	.1459[illegible] 00	.16[illegible] 08	.15676E 00	.16500E 08	.16396E 00	28	3	16	1858
.17000E 08	.17062E 00	.175[illegible] 08	.17765E 00	.18000E 08	.18449E 00	28	3	16	1859

.18500E 08	.19116E 00	.19000E 08	.19750E 08	.19500E 08	.20471E 00	28	3	14	1860
.20000E 08	.21147E 00					28	3	16	1861
.00000E 00	.00000E 00					28	3	0	1862
2.50000+ 4	5.61626+ 1	0	99	0	0	28	3	22	1863
0.00000E+00-6.2950E+00		0	0	1	8	28	3	22	1864
8	2	0	0	0	0	28	3	22	1865
.54010E 07	.00000E 00	.60000E 07	.50000E-02	.10000E 08	.15000E-01	28	3	22	1866
.12000E 08	.33000E-01	.14000E 08	.40000E-01	.16000E 08	.48000E-01	28	3	22	1867
.18000E 08	.54000E-01	.20000E 08	.56000E-01	.00000E 00	.00000E 00	28	3	22	1868
.00000E 00	.00000E 00					28	3	0	1869
2.50000+ 4	5.81626+ 1	0	99	0	0	28	3	28	1870
0.00000E+00-6.1772E+00		0	0	1	6	28	3	28	1871
8	2	0	0	0	0	28	3	28	1872
.93190E 07	.00000E 00	.96920E 07	.58808E-01	.10000E 08	.73106E-01	28	3	28	1873
.12000E 08	.21279E 00	.14500E 08	.41192E 00	.16000E 08	.59920E 00	28	3	28	1874
.18000E 08	.59876E 00	.20000E 08	.65683E 00	.00000E 00	.00000E 00	28	3	28	1875
.00000E 00	.00000E 00					28	3	0	1876
2.50000+ 4	5.81626+ 1	0	1	0	0	28	3	51	1877
0.0 + 0-.11720E 07		0	0	1	11	28	3	51	1878
11	2	0	0	0	0	28	3	51	1879
.11920E 07	.00000E 00	.15000E 07	.30000E-01	.20000E 07	.39000E-01	28	3	51	1880
.25000E 07	.40000E-01	.30000E 07	.37000E-01	.40000E 07	.26000E-01	28	3	51	1881
.50000E 07	.80000E-02	.80000E 07	.40000E-02	.10000E 08	.20000E-02	28	3	51	1882
.14000E 08	.10000E-02	.20000E 08	.10000E-02	.00000E 00	.00000E 00	28	3	51	1883
.00000E 00	.00000E 00					28	3	0	1884
2.50000+ 4	5.61826+ 1	0	2	0	0	28	3	52	1885
0.0 + 0-.13330E 07		0	0	1	27	28	3	52	1886
27	2	0	0	0	0	28	3	52	1887
.13350E 07	.00000E 00	.14000E 07	.71000E-01	.14500E 07	.12[illegible]00E 00	28	3	52	1888
.15000E 07	.14000E 00	.15500E 07	.13500E 00	.16000E 07	.12700E 00	28	3	52	1889
.16500E 07	.12200E 00	.17000E 07	.14400E 00	.17500E 07	.12[illegible]00E 00	28	3	52	1890
.18000E 07	.13500E 00	.18500E 07	.13000E 00	.19000E 07	.17000E 00	28	3	52	1891
.19500E 07	.17500E 00	.20000E 07	.16000E 00	.22000E 07	.15000E 00	28	3	52	1892
.24000E 07	.17600E 00	.26000E 07	.17100E 00	.28000E 07	.16200E 00	28	3	52	1893
.30000E 07	.14400E 00	.35000E 07	.10600E 00	.40000E 07	.81000E-01	28	3	52	1894
.50000E 07	.59000E-01	.60000E 07	.42000E-01	.80000E 07	.25000E-01	28	3	52	1895
.10000E 08	.18000E-01	.14000E 08	.97000E-02	.20000E 08	.9[illegible]00E-02	28	3	52	1896
.00000E 00	.00000E 00					28	3	0	1897
2.50000+ 4	5.61826+ 1	0	3	0	0	28	3	53	1898
0. + 0-.14540E 07		0	0	1	26	28	3	53	1899
26	2	0	0	0	0	28	3	53	1900
.14790E 07	.00000E 00	.15000E 07	.15000E 00	.15500E 07	.11500E 00	28	3	53	1901
.16000E 07	.15000E 00	.16500E 07	.26000E 00	.17000E 07	.20000E 00	28	3	53	1902
.17500E 07	.23000E 00	.18000E 07	.32000E 00	.18500E 07	.25500E 00	28	3	53	1903
.19000E 07	.25000E 00	.20000E 07	.38000E 00	.22500E 07	.37000E 00	28	3	53	1904
.24000E 07	.44000E 00	.26000E 07	.45000E 00	.28000E 07	.46000E 00	28	3	53	1905
.30000E 07	.43000E 00	.35000E 07	.32000E 00	.40000E 07	.23500E 00	28	3	53	1906
.50000E 07	.15000E 00	.60000E 07	.10000E 00	.80000E 07	.55000E-01	28	3	53.	1907
.10000E 08	.35000E-01	.12000E 08	.29000E-01	.14000E 08	.26000E-01	28	3	53	1908
.16000E 08	.27000E-01	.20000E 08	.26000E-01	.00000E 00	.00000E 00	28	3	53	1909
.00000E 00	.00000E 00					28	3	0	1910
2.50000+ 4	5.61626+ 1	0	4	0	0	28	3	54	1911
0.0 + 0-.21580E 07		0	0	1	13	28	3	54	1912
13	2	0	0	0	0	28	3	54	1913
.21950E 07	.00000E 00	.22000E 07	.11000E-01	.24000E 07	.60000E-01	28	3	54	1914
.25000E 07	.80000E-01	.28000E 07	.85000E-01	.30000E 07	.90000E-01	28	3	54	1915
.35000E 07	.60000E-01	.40000E 07	.60000E-01	.60000E 07	.17000E-01	28	3	54	1916
.80000E 07	.30000E-02	.10000E 08	.25000E-02	.14000E 08	.20000E-02	28	3	54	1917
.20000E 08	.10000E-02	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	3	54	1918
.00000E 00	.00000E 00					28	3	0	1919

2.00000+ 4	5.61826+ 1	0	5	0	0	28	3	55	1920
0.0 +	0-.22500E 07	0	0	1	13	28	3	55	1921
13	2	0	0	0	0	28	3	55	1922
.23240E 07	.00000E 00	.24000E 07	.20000E-01	.26000E 07	.42000E-01	28	3	55	1923
.25000E 07	.55000E-01	.30000E 07	.55000E-01	.35000E 07	.54000E-01	28	3	55	1924
.40000E 07	.40000E-01	.50000E 07	.22000E-01	.60000E 07	.10000E-01	28	3	55	1925
.80000E 07	.25000E-02	.10000E 08	.15000E-02	.14000E 08	.10000E-02	28	3	55	1926
.20000E 08	.10000E-02	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	3	55	1927
.00000E 00	.00000E 00					28	3	0	1928
2.00000+ 4	5.61826+ 1	0	6	0	0	28	3	56	1929
0.0 +	0-.24590E 07	0	0	1	15	28	3	56	1930
15	2	0	0	0	0	28	3	56	1931
.25000E 07	.00000E 00	.26000E 07	.25900E-01	.28000E 07	.50000E-01	28	3	56	1932
.30000E 07	.66000E-01	.32000E 07	.79700E-01	.34000E 07	.85000E-01	28	3	56	1933
.36000E 07	.87000E-01	.40000E 07	.79000E-01	.50000E 07	.50000E-01	28	3	56	1934
.60000E 07	.25000E-01	.70000E 07	.21000E-01	.80000E 07	.14000E-01	28	3	56	1935
.10000E 08	.70000E-02	.14000E 08	.60000E-02	.20000E 08	.50000E-02	28	3	56	1936
.00000E 00	.00000E 00					28	3	0	1937
2.00000+ 4	5.61826+ 1	0	7	0	0	28	3	57	1938
0.0 +	0-.25100E 07	0	0	1	15	28	3	57	1939
15	2	0	0	0	0	28	3	57	1940
.25450E 07	.00000E 00	.26000E 07	.49000E-02	.28000E 07	.99000E-02	28	3	57	1941
.30000E 07	.15500E-01	.32000E 07	.15700E-01	.34000E 07	.16900E-01	28	3	57	1942
.36000E 07	.17400E-01	.40000E 07	.15700E-01	.50000E 07	.10100E-01	28	3	57	1943
.60000E 07	.54000E-02	.70000E 07	.41000E-02	.80000E 07	.28000E-02	28	3	57	1944
.10000E 08	.15000E-02	.14000E 08	.12000E-02	.20000E 08	.10000E-02	28	3	57	1945
.00000E 00	.00000E 00					28	3	0	1946
2.00000+ 4	5.61826+ 1	0	8	0	0	28	3	58	1947
0.0 +	0-.26200E 07	0	0	1	11	28	3	58	1948
11	2	0	0	0	0	28	3	58	1949
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.35000E 07	.54000E-01	.40000E 07	.53000E-01	.50000E 07	.35000E-01	28	3	58	1951
.60000E 07	.25000E-01	.80000E 07	.10000E-01	.10000E 08	.80000E-02	28	3	58	1952
.14000E 08	.60000E-02	.20000E 08	.40000E-02	.00000E 00	.00000E 00	28	3	58	1953
.00000E 00	.00000E 00					28	3	0	1954
2.00000+ 4	5.61826+ 1	0	9	0	0	28	3	59	1955
0.0 +	0-.27750E 07	0	0	1	13	28	3	59	1956
13	2	0	0	0	0	28	3	59	1957
.28220E 07	.00000E 00	.29000E 07	.58000E-01	.30000E 07	.90000E-01	28	3	59	1958
.32500E 07	.12500E 00	.35000E 07	.14000E 00	.37500E 07	.14000E 00	28	3	59	1959
.40000E 07	.13200E 00	.50000E 07	.95000E-01	.60000E 07	.60000E-01	28	3	59	1960
.80000E 07	.25000E-01	.10000E 08	.15000E-01	.14000E 08	.13000E-01	28	3	59	1961
.20000E 08	.10000E-01	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	3	59	1962
.00000E 00	.00000E 00					28	3	0	1963
2.00000+ 4	5.61826+ 1	0	10	0	0	28	3	60	1964
0.0 +	0-.29000E 07	0	0	1	13	28	3	60	1965
13	2	0	0	0	0	28	3	60	1966
.30100E 07	.00000E 00	.31100E 07	.10000E 00	.32500E 07	.14500E 00	28	3	60	1967
.35000E 07	.18500E 00	.37500E 07	.19500E 00	.40500E 07	.18500E 00	28	3	60	1968
.45000E 07	.16500E 00	.50000E 07	.15000E 00	.60000E 07	.12000E 00	28	3	60	1969
.80000E 07	.65000E-01	.10000E 08	.30000E-01	.14000E 08	.15000E-01	28	3	60	1970
.20000E 08	.10000E-01	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	3	60	1971
.00000E 00	.00000E 00					28	3	0	1972
2.00000+ 4	5.61826+ 1	0	11	0	0	28	3	61	1973
0.0 +	0-.32700E 07	0	0	1	12	28	3	61	1974
12	2	0	0	0	0	28	3	61	1975
.33250E 07	.00000E 00	.35000E 07	.11000E 00	.37500E 07	.17000E 00	28	3	61	1976
.40000E 07	.18000E 00	.42500E 07	.18000E 00	.45000E 07	.17500E 00	28	3	61	1977
.50000E 07	.16000E 00	.60000E 07	.11500E 00	.80000E 07	.65000E-01	28	3	61	1978
.10000E 08	.30000E-01	.14000E 08	.15000E-01	.20000E 08	.10000E-01	28	3	61	1979

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.00000E 00 .00000E 00                                                        28 3   0 1980
2.50000+ 4 5.81826+ 1          0          12           0           0         28 3  62 1981
0.0     + 0-.36280E 07         0           0           1          11         28 3  62 1982
      11           2           0           0           0           0         28 3  62 1983
.36890E 07 .00000E 00 .37500E 07 .50000E-01 .40000E 07 .12500E 00           28 3  62 1984
.42500E 07 .14500E 00 .45000E 07 .14500E 00 .50000E 07 .13000E 00           28 3  62 1985
.60000E 07 .80000E-01 .80000E 07 .30000E-01 .10000E 08 .15000E-01           28 3  62 1986
.14000E 08 .10000E-01 .20000E 08 .80000E-02 .00000E 00 .00000E 00           28 3  62 1987
.00000E 00 .00000E 00                                                        28 3   0 1988
2.50000+ 4 5.81826+ 1          0          98           0           0         28 3  91 1989
0.0     + 0 0.0   00+ 0        0           0           1          15         28 3  91 1990
      15           2           0           0           0           0         28 3  91 1991
.37630E 07 .00000E 00 .40000E 07 .02500E 00 .43000E 07 .10000E 00           28 3  91 1992
.45000E 07 .15000E 00 .50000E 07 .27500E 00 .60000E 07 .47500E 00           28 3  91 1993
.70000E 07 .54000E 00 .80000E 07 .59000E 00 .90000E 07 .56000E 00           28 3  91 1994
.10000E 08 .52800E 00 .12000E 08 .44000E 00 .14000E 08 .32000E 00           28 3  91 1995
.16000E 08 .20000E 00 .18000E 08 .90000E-01 .20000E 08 .50000E-01           28 3  91 1996
.00000E 00 .00000E 00                                                        28 3   0 1997
2.50000+ 4 5.81826+ 1          0          99           0           0         28 3102 1998
0.0000E+00 8.6000E+06          0           0           2         653         28 3102 1999
      45           5         653           2           0           0         28 3102 2000
1.00000- 5 1.46370+ 2 1.00000- 4 4.62870+ 1 1.00000- 3 1.46370+ 1          28 3102 2001
1.00000- 2 4.62870+ 0 2.53000- 2 2.91010+ 0 3.36743- 2 2.52240+ 0          28 3102 2002
4.48205- 2 2.18640+ 0 5.96561- 2 1.89510+ 0 7.94022- 2 1.64260+ 0          28 3102 2003
1.05684- 1 1.42380+ 0 1.40666- 1 1.23420+ 0 1.87226- 1 1.06970+ 0          28 3102 2004
2.49196- 1 9.27230- 1 3.31683- 1 8.03710- 1 4.41470- 1 6.96640- 1          28 3102 2005
5.87596- 1 6.03840- 1 7.82091- 1 5.23400- 1 1.04096+ 0 4.53670- 1          28 3102 2006
1.38552+ 0 3.93240- 1 1.84413+ 0 3.40850- 1 2.45454+ 0 2.95450- 1          28 3102 2007
3.26699+ 0 2.56090- 1 4.34836+ 0 2.21970- 1 5.78767+ 0 1.92400- 1          28 3102 2008
7.70338+ 0 1.66770- 1 1.02532+ 1 1.44550- 1 1.36470+ 1 1.25300- 1          28 3102 2009
1.81642+ 1 1.08600- 1 2.41765+ 1 9.41370- 2 3.21789+ 1 8.15960- 2          28 3102 2010
4.28302+ 1 7.07260- 2 5.70070+ 1 6.13030- 2 7.58763+ 1 5.31365- 2          28 3102 2011
1.00991+ 2 4.60570- 2 1.22199+ 2 4.18690- 2 1.62648+ 2 3.62910- 2          28 3102 2012
2.16484+ 2 3.14550- 2 2.88140+ 2 2.72630- 2 3.83514+ 2 2.36300- 2          28 3102 2013
5.10458+ 2 2.04800- 2 6.17654+ 2 1.86170- 2 8.22097+ 2 1.61330- 2          28 3102 2014
9.94738+ 2 1.46640- 2 1.29104+ 3 1.27610- 2 1.29134+ 3 1.25840- 2          28 3102 2015
1.29155+ 3 1.26020- 2 1.29179+ 3 1.23140- 2 1.29186+ 3 1.24480- 2          28 3102 2016
1.29201+ 3 1.22570- 2 1.29214+ 3 1.24180- 2 1.29230+ 3 1.22590- 2          28 3102 2017
1.29245+ 3 1.27840- 2 1.29266+ 3 1.25660- 2 1.29342+ 3 1.28460- 2          28 3102 2018
1.76224+ 3 1.10010- 2 2.25226+ 3 9.65000- 3 2.25378+ 3 9.53400- 3          28 3102 2019
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2.25631+ 3 5.80010- 4 2.25653+ 3-7.15010- 3 2.25668+ 3 6.90010- 3          28 3102 2021
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2.25732+ 3 5.39990- 3 2.25747+ 3-6.40060- 3 2.25769+ 3 5.79950- 4          28 3102 2023
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5.52762+ 3 6.40800- 3 5.52852+ 3 5.99600- 3 5.52899+ 3 6.46800- 3          28 3102 2028
5.52931+ 3 5.65000- 3 5.52953+ 3 4.85000- 3 5.52978+ 3-6.56010- 3          28 3102 2029
5.52985+ 3-5.33000- 3 5.53001+ 3-8.00010- 4 5.53015+ 3-6.61000- 3          28 3102 2030
5.53032+ 3 5.19000- 3 5.53047+ 3 4.85000- 3 5.53069+ 3 5.63000- 3          28 3102 2031
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6.89147+ 3 5.56000- 3 6.89216+ 3 5.68400- 3 6.90005+ 3 5.65060- 3          28 3102 2038
8.09744+ 3 5.21390- 3 8.41520+ 3 5.12390- 3 8.61219+ 3 5.07270- 3          28 3102 2039
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6.90718+ 3	5.00300- 3	9.27816+ 3	2.80000- 2	1.00000+ 4	2.60000- 2	28	3102	2040
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2.54132+ 4	1.11110- 2	2.59780+ 4	1.16090- 2	2.65768+ 4	1.10920- 2	28	3102	2042
2.65842+ 4	1.11300- 2	2.65892+ 4	1.11360- 2	2.65927+ 4	1.16900- 2	28	3102	2043
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2.65984+ 4	-3.65000- 3	2.65989+ 4	6.60000- 3	2.65997+ 4	5.03050- 2	28	3102	2045
2.66005+ 4	1.35300- 1	2.66010+ 4	6.59990- 2	2.66016+ 4	-3.17000- 3	28	3102	2046
2.66023+ 4	1.16900- 2	2.66034+ 4	6.50000- 3	2.66050+ 4	1.24620- 2	28	3102	2047
2.66073+ 4	1.16910- 2	2.66100+ 4	1.11460- 2	2.66158+ 4	1.11380- 2	28	3102	2048
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2.82151+ 4	1.37230- 2	2.83699+ 4	1.56400- 2	2.84753+ 4	1.72460- 2	28	3102	2051
2.85471+ 4	1.70660- 2	2.87000+ 4	1.66730- 2	2.88529+ 4	5.30150- 3	28	3102	2052
2.90301+ 4	6.59600- 3	2.91849+ 4	8.32650- 3	2.94123+ 4	9.67140- 3	28	3102	2053
2.97464+ 4	1.03850- 2	2.99030+ 4	1.05260- 2	3.00939+ 4	1.06260- 2	28	3102	2054
3.00972+ 4	1.35770- 2	3.00981+ 4	9.18600- 3	3.00997+ 4	9.16910- 3	28	3102	2055
3.01013+ 4	1.50700- 2	3.01019+ 4	9.18600- 3	3.01028+ 4	1.05800- 2	28	3102	2056
3.01061+ 4	1.02270- 2	3.01090+ 4	1.06150- 2	3.01132+ 4	1.06250- 2	28	3102	2057
3.08927+ 4	1.07650- 2	3.09557+ 4	1.07600- 2	3.16722+ 4	1.07800- 2	28	3102	2058
3.20174+ 4	1.07330- 2	3.21600+ 4	1.07670- 2	3.22175+ 4	1.07900- 2	28	3102	2059
3.22757+ 4	1.07930- 2	3.23154+ 4	1.08010- 2	3.23424+ 4	1.08070- 2	28	3102	2060
3.23608+ 4	1.08250- 2	3.23733+ 4	1.08760- 2	3.23818+ 4	1.09270- 2	28	3102	2061
3.23876+ 4	1.09270- 2	3.23916+ 4	1.01620- 2	3.23943+ 4	1.31200- 2	28	3102	2062
3.23961+ 4	1.36300- 2	3.23973+ 4	-1.57010- 3	3.23983+ 4	1.63660- 2	28	3102	2063
3.23992+ 4	3.05000- 2	3.24000+ 4	2.11000- 2	3.24012+ 4	1.98000- 2	28	3102	2064
3.24026+ 4	1.45000- 3	3.24039+ 4	1.56100- 2	3.24057+ 4	1.36600- 2	28	3102	2065
3.24084+ 4	1.03730- 2	3.24124+ 4	1.09970- 2	3.24182+ 4	1.09550- 2	28	3102	2066
3.24267+ 4	1.08910- 2	3.24392+ 4	1.08360- 2	3.24576+ 4	1.08190- 2	28	3102	2067
3.24846+ 4	1.08170- 2	3.24921+ 4	1.08170- 2	3.25242+ 4	1.08180- 2	28	3102	2068
3.25325+ 4	1.08240- 2	3.27181+ 4	1.08460- 2	3.28720+ 4	1.08660- 2	28	3102	2069
3.28801+ 4	1.08650- 2	3.28864+ 4	1.08660- 2	3.28908+ 4	1.08480- 2	28	3102	2070
3.28937+ 4	1.08740- 2	3.28957+ 4	1.06950- 2	3.28971+ 4	1.09460- 2	28	3102	2071
3.28980+ 4	1.05990- 2	3.28997+ 4	1.92470- 2	3.29013+ 4	1.25620- 2	28	3102	2072
3.29020+ 4	1.05930- 2	3.29029+ 4	1.08670- 2	3.29043+ 4	1.06950- 2	28	3102	2073
3.29063+ 4	1.08800- 2	3.29092+ 4	1.08500- 2	3.29135+ 4	1.08660- 2	28	3102	2074
3.29199+ 4	1.08650- 2	3.29767+ 4	1.08600- 2	3.32000+ 4	1.07220- 2	28	3102	2075
3.32855+ 4	1.06510- 2	3.32901+ 4	1.06460- 2	3.32933+ 4	1.06620- 2	28	3102	2076
3.32954+ 4	1.05460- 2	3.32969+ 4	1.07620- 2	3.32979+ 4	1.02370- 2	28	3102	2077
3.32997+ 4	9.03280- 3	3.33014+ 4	8.41100- 3	3.33021+ 4	1.02970- 2	28	3102	2078
3.33031+ 4	1.08270- 2	3.33046+ 4	1.06570- 2	3.33067+ 4	1.06590- 2	28	3102	2079
3.33099+ 4	1.06350- 2	3.33145+ 4	1.06350- 2	3.34233+ 4	1.06040- 2	28	3102	2080
3.35734+ 4	1.06080- 2	3.36819+ 4	1.06250- 2	3.39079+ 4	1.06550- 2	28	3102	2081
3.41330+ 4	1.06710- 2	3.41544+ 4	1.06720- 2	3.41690+ 4	1.06600- 2	28	3102	2082
3.41789+ 4	1.06930- 2	3.41856+ 4	1.06910- 2	3.41902+ 4	1.07510- 2	28	3102	2083
3.41933+ 4	1.05260- 2	3.41955+ 4	1.18780- 2	3.41969+ 4	1.28800- 2	28	3102	2084
3.41979+ 4	8.25000- 3	3.41985+ 4	-1.15400- 2	3.41990+ 4	-3.13300- 2	28	3102	2085
3.41997+ 4	1.14310- 1	3.42005+ 4	-2.37000- 2	3.42009+ 4	-7.97340- 3	28	3102	2086
3.42014+ 4	7.67990- 3	3.42021+ 4	7.67000- 3	3.42031+ 4	1.23400- 2	28	3102	2087
3.42045+ 4	1.17050- 2	3.42057+ 4	1.04720- 2	3.42098+ 4	1.07460- 2	28	3102	2088
3.42144+ 4	1.06870- 2	3.42211+ 4	1.06930- 2	3.42310+ 4	1.06620- 2	28	3102	2089
3.42456+ 4	1.06750- 2	3.42670+ 4	1.06750- 2	3.47277+ 4	1.06720- 2	28	3102	2090
3.57320+ 4	1.06450- 2	3.58592+ 4	1.06420- 2	3.59962+ 4	1.06380- 2	28	3102	2091
3.60294+ 4	1.06380- 2	3.60519+ 4	1.06390- 2	3.60673+ 4	1.06480- 2	28	3102	2092
3.60777+ 4	1.06780- 2	3.60848+ 4	1.06690- 2	3.60897+ 4	1.08830- 2	28	3102	2093
3.60930+ 4	1.09530- 2	3.60952+ 4	9.35000- 3	3.60967+ 4	1.43700- 2	28	3102	2094
3.60978+ 4	1.90200- 2	3.60985+ 4	1.80200- 2	3.60996+ 4	6.74740- 2	28	3102	2095
3.61007+ 4	2.45000- 2	3.61015+ 4	1.86600- 2	3.61022+ 4	1.94000- 2	28	3102	2096
3.61033+ 4	1.45200- 2	3.61048+ 4	9.40600- 3	3.61070+ 4	1.09740- 2	28	3102	2097
3.61103+ 4	1.08730- 2	3.61152+ 4	1.06860- 2	3.61223+ 4	1.06760- 2	28	3102	2098
3.61327+ 4	1.06470- 2	3.61481+ 4	1.06370- 2	3.61706+ 4	1.06340- 2	28	3102	2099

3.62038+ 4	1.06320- 2	3.64970+ 4	1.06220- 2	3.72174+ 4	1.05990- 2	28	3102	2100
3.83724+ 4	1.05270- 2	3.93935+ 4	1.04670- 2	3.93956+ 4	1.05750- 2	28	3102	2101
3.93970+ 4	9.75400- 3	3.93980+ 4	1.12530- 2	3.93985+ 4	4.55630- 3	28	3102	2102
3.93991+ 4	-2.06000- 3	3.94002+ 4	7.96050- 3	3.94014+ 4	1.37400- 2	28	3102	2103
3.94020+ 4	1.10250- 2	3.94030+ 4	9.75300- 3	3.94044+ 4	1.05490- 2	28	3102	2104
3.94205+ 4	1.05270- 2	4.03642+ 4	1.05650- 2	4.09283+ 4	9.68940- 3	28	3102	2105
4.12680+ 4	9.68000- 3	4.16037+ 4	9.66570- 3	4.22112+ 4	9.65600- 3	28	3102	2106
4.24886+ 4	9.65440- 3	4.26774+ 4	9.67120- 3	4.28060+ 4	9.74170- 3	28	3102	2107
4.28935+ 4	9.97650- 3	4.29530+ 4	1.06750- 2	4.29936+ 4	1.24740- 2	28	3102	2108
4.30212+ 4	1.60660- 2	4.30399+ 4	2.08230- 2	4.30527+ 4	2.40930- 2	28	3102	2109
4.30614+ 4	2.38690- 2	4.30800+ 4	9.22400- 3	4.30986+ 4	-4.40800- 3	28	3102	2110
4.31073+ 4	-4.34000- 3	4.31383+ 4	3.14900- 3	4.31664+ 4	6.60630- 3	28	3102	2111
4.32070+ 4	8.42440- 3	4.32665+ 4	9.18620- 3	4.33540+ 4	9.47110- 3	28	3102	2112
4.34926+ 4	9.56820- 3	4.36714+ 4	9.59810- 3	4.39488+ 4	9.60330- 3	28	3102	2113
4.43563+ 4	9.59750- 3	4.49549+ 4	9.56450- 3	4.60023+ 4	9.56020- 3	28	3102	2114
4.73903+ 4	9.54700- 3	4.73955+ 4	9.51700- 3	4.73970+ 4	9.62900- 3	28	3102	2115
4.73979+ 4	1.33600- 2	4.73985+ 4	7.63400- 3	4.73990+ 4	1.92000- 3	28	3102	2116
4.73997+ 4	6.85550- 4	4.74004+ 4	2.51400- 2	4.74014+ 4	2.35000- 3	28	3102	2117
4.74021+ 4	1.33500- 2	4.74030+ 4	9.45100- 3	4.74045+ 4	9.45500- 3	28	3102	2118
4.74142+ 4	9.51460- 3	4.74450+ 4	9.52510- 3	4.77872+ 4	9.52300- 3	28	3102	2119
4.78232+ 4	9.52790- 3	4.78477+ 4	9.53930- 3	4.78644+ 4	9.55030- 3	28	3102	2120
4.78758+ 4	9.55700- 3	4.78835+ 4	9.59600- 3	4.78888+ 4	9.84800- 3	28	3102	2121
4.78924+ 4	1.10400- 2	4.78948+ 4	1.18100- 2	4.78965+ 4	1.40200- 2	28	3102	2122
4.78984+ 4	1.53200- 2	4.78989+ 4	2.78000- 2	4.79000+ 4	1.51000- 2	28	3102	2123
4.79011+ 4	2.61000- 2	4.79016+ 4	1.36800- 2	4.79035+ 4	1.32900- 2	28	3102	2124
4.79052+ 4	1.14800- 2	4.79076+ 4	1.09200- 2	4.79112+ 4	9.85400- 3	28	3102	2125
4.79165+ 4	9.58600- 3	4.79242+ 4	9.55500- 3	4.79356+ 4	9.54990- 3	28	3102	2126
4.79523+ 4	9.53690- 3	4.79768+ 4	9.52560- 3	4.80657+ 4	9.51600- 3	28	3102	2127
4.81434+ 4	9.51310- 3	4.95947+ 4	9.43610- 3	4.95964+ 4	9.57330- 3	28	3102	2128
4.95975+ 4	8.71200- 3	4.95983+ 4	7.51400- 3	4.95997+ 4	1.09670- 2	28	3102	2129
4.96011+ 4	1.19950- 2	4.96017+ 4	7.64600- 3	4.96025+ 4	8.82800- 3	28	3102	2130
4.96036+ 4	9.61160- 3	4.96053+ 4	9.44450- 3	4.96115+ 4	9.48070- 3	28	3102	2131
4.96169+ 4	9.47740- 3	5.14951+ 4	9.31630- 3	5.14967+ 4	9.93300- 3	28	3102	2132
5.14977+ 4	8.53900- 3	5.14996+ 4	2.11290- 2	5.15015+ 4	8.73400- 3	28	3102	2133
5.15023+ 4	8.52800- 3	5.15033+ 4	8.99200- 3	5.15049+ 4	9.30350- 3	28	3102	2134
5.15105+ 4	9.43570- 3	5.15155+ 4	9.43670- 3	5.30367+ 4	9.41280- 3	28	3102	2135
5.34463+ 4	9.39760- 3	5.35592+ 4	9.37930- 3	5.36361+ 4	9.33510- 3	28	3102	2136
5.37241+ 4	9.03520- 3	5.37483+ 4	8.77940- 3	5.37761+ 4	8.59180- 3	28	3102	2137
5.38000+ 4	9.32170- 3	5.38240+ 4	1.01020- 2	5.38759+ 4	9.72350- 3	28	3102	2138
5.39116+ 4	9.54150- 3	5.47792+ 4	9.38370- 3	5.47904+ 4	9.39800- 3	28	3102	2139
5.47934+ 4	9.36720- 3	5.47955+ 4	9.66200- 3	5.47970+ 4	9.40000- 3	28	3102	2140
5.47979+ 4	9.57700- 3	5.47985+ 4	1.16800- 2	5.47990+ 4	1.37800- 2	28	3102	2141
5.47997+ 4	6.46670- 3	5.48004+ 4	-2.63200- 2	5.48014+ 4	1.20800- 2	28	3102	2142
5.48021+ 4	9.82800- 3	5.48030+ 4	9.38300- 3	5.48045+ 4	9.69000- 3	28	3102	2143
5.48066+ 4	9.36560- 3	5.48142+ 4	9.38640- 3	5.48306+ 4	9.38360- 3	28	3102	2144
5.50164+ 4	9.37910- 3	5.62876+ 4	9.33690- 3	5.62942+ 4	9.32450- 3	28	3102	2145
5.62961+ 4	9.01600- 3	5.62973+ 4	8.35600- 3	5.62982+ 4	6.92500- 3	28	3102	2146
5.62997+ 4	9.17670- 3	5.63012+ 4	5.63300- 3	5.63018+ 4	8.20900- 3	28	3102	2147
5.63027+ 4	8.84900- 3	5.63039+ 4	9.16600- 3	5.63057+ 4	9.36130- 3	28	3102	2148
5.63084+ 4	9.32010- 3	5.63268+ 4	9.35600- 3	5.68953+ 4	9.30960- 3	28	3102	2149
5.68968+ 4	9.55800- 3	5.68978+ 4	9.46400- 3	5.68997+ 4	9.09600- 3	28	3102	2150
5.69015+ 4	1.12660- 2	5.69022+ 4	9.47600- 3	5.69032+ 4	9.58800- 3	28	3102	2151
5.69047+ 4	9.31950- 3	5.69148+ 4	9.34740- 3	5.91933+ 4	9.32020- 3	28	3102	2152
5.99231+ 4	9.31370- 3	6.03448+ 4	9.31000- 3	6.11287+ 4	9.29770- 3	28	3102	2153
6.16623+ 4	9.27430- 3	6.20256+ 4	9.24420- 3	6.23674+ 4	9.20670- 3	28	3102	2154
6.28000+ 4	9.16580- 3	6.33037+ 4	9.15750- 3	6.39411+ 4	9.17970- 3	28	3102	2155
6.43750+ 4	9.17420- 3	6.46703+ 4	9.12140- 3	6.48714+ 4	8.98150- 3	28	3102	2156
6.50082+ 4	8.70750- 3	6.51014+ 4	8.34770- 3	6.52080+ 4	8.08370- 3	28	3102	2157
6.52552+ 4	8.43460- 3	6.53000+ 4	9.13620- 3	6.53920+ 4	1.07610- 2	28	3102	2158
6.54986+ 4	1.00540- 2	6.55918+ 4	9.70260- 3	6.57286+ 4	9.43220- 3	28	3102	2159

6.59297+ 4	9.29230- 3	6.62250+ 4	9.23380- 3	6.73752+ 4	9.19260- 3	28	3102	2160
6.60984+ 4	1.70510- 2	7.06536+ 4	1.70460- 2	7.12902+ 4	1.70290- 2	28	3102	2161
7.12955+ 4	1.70260- 2	7.12969+ 4	1.68620- 2	7.12979+ 4	1.72980- 2	28	3102	2162
7.12997+ 4	1.54670- 2	7.13014+ 4	1.75170- 2	7.13021+ 4	1.71330- 2	28	3102	2163
7.13031+ 4	1.65520- 2	7.13045+ 4	1.70550- 2	7.13143+ 4	1.70320- 2	28	3102	2164
7.16288+ 4	1.70330- 2	7.53919+ 4	1.69660- 2	7.56694+ 4	1.69820- 2	28	3102	2165
7.59395+ 4	1.69740- 2	7.59583+ 4	1.69700- 2	7.60000+ 4	1.69730- 2	28	3102	2166
7.60869+ 4	1.69560- 2	7.76343+ 4	1.69700- 2	7.95977+ 4	1.69420- 2	28	3102	2167
7.97576+ 4	1.69400- 2	8.20436+ 4	1.69160- 2	8.32579+ 4	1.69040- 2	28	3102	2168
8.36283+ 4	1.68970- 2	8.54122+ 4	1.68730- 2	8.57014+ 4	1.66620- 2	28	3102	2169
8.59191+ 4	1.68460- 2	8.62642+ 4	1.67900- 2	8.64992+ 4	1.66420- 2	28	3102	2170
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8.68925+ 4	8.24030- 3	8.69265+ 4	8.22450- 3	8.70000+ 4	1.07820- 2	28	3102	2172
8.70732+ 4	1.35190- 2	8.71475+ 4	1.36560- 2	8.72321+ 4	1.21030- 2	28	3102	2173
8.73409+ 4	1.14050- 2	8.74765+ 4	1.10660- 2	8.75008+ 4	1.10590- 2	28	3102	2174
8.77358+ 4	1.09230- 2	8.80609+ 4	1.08750- 2	8.85878+ 4	1.08560- 2	28	3102	2175
8.87642+ 4	1.08520- 2	8.94329+ 4	1.08420- 2	9.04267+ 4	1.08240- 2	28	3102	2176
9.10401+ 4	1.08080- 2	9.15564+ 4	1.07660- 2	9.20339+ 4	1.07570- 2	28	3102	2177
9.27241+ 4	1.06960- 2	9.29716+ 4	1.06690- 2	9.34277+ 4	1.07680- 2	28	3102	2178
9.35000+ 4	1.07930- 2	9.40262+ 4	1.09380- 2	9.42759+ 4	1.09450- 2	28	3102	2179
9.50792+ 4	1.06630- 2	9.51745+ 4	1.08590- 2	9.59735+ 4	1.06110- 2	28	3102	2180
9.59985+ 4	1.06100- 2	9.65907+ 4	1.07870- 2	9.69685+ 4	1.07600- 2	28	3102	2181
9.74894+ 4	1.06870- 2	9.75550+ 4	1.06690- 2	9.78440+ 4	1.05280- 2	28	3102	2182
9.80854+ 4	1.02320- 2	9.82497+ 4	9.84650- 3	9.83615+ 4	9.57670- 3	28	3102	2183
9.84377+ 4	9.95580- 3	9.85000+ 4	1.06930- 2	9.87623+ 4	1.20110- 2	28	3102	2184
9.85086+ 4	1.20060- 2	9.89503+ 4	1.17710- 2	9.90508+ 4	1.14920- 2	28	3102	2185
9.91146+ 4	1.13470- 2	9.93560+ 4	1.10240- 2	9.95111+ 4	1.09280- 2	28	3102	2186
9.97106+ 4	1.08610- 2	1.00000+ 5	1.07940- 2	1.00000+ 5	0.83000- 2	28	3102	2187
.10200E 06	.18140E-01	.10570E 06	.55400E-02	.10670E 06	.39420E-01	28	3102	2188
.10720E 06	.37150E-01	.10870E 06	.51300E-01	.11070E 06	.21960E-01	28	3102	2189
.11170E 06	.29200E-01	.11470E 06	.55500E-02	.11570E 06	.34400E-02	28	3102	2190
.11670E 06	.77200E-02	.12020E 06	.36560E-01	.12120E 06	.45490E-01	28	3102	2191
.12120E 06	.35510E-01	.12320E 06	.22460E-01	.12420E 06	.25470E-01	28	3102	2192
.12520E 06	.32690E-01	.12720E 06	.17340E-01	.12820E 06	.66000E-02	28	3102	2193
.13020E 06	.13420E-01	.13120E 06	.11900E-01	.13320E 06	.15460E-01	28	3102	2194
.13520E 06	.27250E-01	.13620E 06	.24760E-01	.13720E 06	.32560E-01	28	3102	2195
.13820E 06	.33440E-01	.13970E 06	.24680E-01	.14020E 06	.28800E-01	28	3102	2196
.14420E 06	.16910E-01	.14620E 06	.25140E-01	.14920E 06	.13990E-01	28	3102	2197
.15020E 06	.16930E-01	.15320E 06	.35600E-02	.15670E 06	.96800E-02	28	3102	2198
.15870E 06	.11500E-01	.16070E 06	.21760E-01	.16270E 06	.31890E-01	28	3102	2199
.16570E 06	.96500E-02	.16770E 06	.12520E-01	.17000E 06	.25000E-01	28	3102	2200
.17200E 06	.25000E-01	.18000E 06	.99000E-02	.19000E 06	.13000E-01	28	3102	2201
.19800E 06	.14000E-01	.20600E 06	.10000E-01	.21600E 06	.10000E-01	28	3102	2202
.21000E 06	.10000E-01	.22000E 06	.13000E-01	.22400E 06	.98000E-02	28	3102	2203
.23200E 06	.16000E-01	.24000E 06	.10000E-01	.24600E 06	.15500E-01	28	3102	2204
.25200E 06	.98000E-02	.25600E 06	.14000E-01	.26600E 06	.98000E-02	28	3102	2205
.27200E 06	.80000E-02	.27600E 06	.11500E-01	.28400E 06	.11000E-01	28	3102	2206
.29200E 06	.15000E-01	.29600E 06	.16000E-01	.29800E 06	.18500E-01	28	3102	2207
.30200E 06	.13000E-01	.31400E 06	.10000E-01	.33000E 06	.90000E-02	28	3102	2208
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.37000E 06	.11000E-01	.38000E 06	.95000E-02	.40000E 06	.85000E-02	28	3102	2210
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.90000E 06	.74000E-02	.10000E 07	.76000E-02	.12000E 07	.78000E-02	28	3102	2213
.14000E 07	.77000E-02	.16000E 07	.68000E-02	.18000E 07	.57000E-02	28	3102	2214
.20000E 07	.49000E-02	.25000E 07	.36000E-02	.30000E 07	.27000E-02	28	3102	2215
.35000E 07	.21000E-02	.40000E 07	.16000E-02	.50000E 07	.11000E-02	28	3102	2216
.60000E 07	.75000E-03	.80000E 07	.45000E-03	.10000E 08	.34000E-03	28	3102	2217
.15000E 08	.27000E-03	.20000E 08	.24000E-03	.00000E 00	.00000E 00	28	3102	2218
.00000E 00	.00000E 00					28	3 0	2219

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101	2					28	3103	2222
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0.00000+ 0	0.00000+ 0	0.00000+ 0	0.00000+ 0	0.00000+ 0	0.00000+ 0	28	4	2	2413
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9.74683- 1						28	4	2	2416
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.00000E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	4	2	2420
.00000E 00	.25000E 05	0	0	1	0	28	4	2	2421
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.73333E-01	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	4	2	2434
.00000E 00	.22500E 06	0	0	2	0	28	4	2	2435
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-0.7	+ 0 .3545	+ 0-0.6	+ 0 0.3430	+ 0-0.5	+ 0 0.3375	+ 0	28 4 52 2636
-0.4	+ 0 .338	+ 0-0.3	+ 0 0.3445	+ 0-0.2	+ 0 0.357	+ 0	28 4 52 2637
-0.1	+ 0 .3755	+ 0 0.0	+ 0 0.4000	+ 0 0.1	+ 0 0.4305	+ 0	28 4 52 2638
.2	+ 0 .467	+ 0 0.3	+ 0 0.5095	+ 0 0.4	+ 0 0.558	+ 0	28 4 52 2639

.5	+ 0 .6125	+ 0 0.6	+ 0 0.6730	+ 0 0.7	+ 0 0.7395	+ 0	28	4	52	2640
.8	+ 0 .8120	+ 0 0.9	+ 0 0.8905	+ 0 1.0	+ 0 0.9750	+ 0	28	4	52	2641
0.0	+ 0 1.4	+ 7	0	0	1	21	28	4	52	2642
	21	2	0	0	0	0	28	4	52	2643
-1.0	+ 0 0.28	+ 0-0.9	+ 0 0.24650	+ 0-0.8	+ 0 0.22200	+ 0	28	4	52	2644
-0.7	+ 0 0.2065	+ 0-0.6	+ 0 0.2	+ 0-0.5	+ 0 0.2025	+ 0	28	4	52	2645
-0.4	+ 0 0.214	+ 0-0.3	+ 0 0.2345	+ 0-0.2	+ 0 0.264	+ 0	28	4	52	2646
-0.1	+ 0 0.3025	+ 0 0.0	+ 0 0.35	+ 0 0.1	+ 0 0.4065	+ 0	28	4	52	2647
0.2	+ 0 0.472	+ 0 0.3	+ 0 0.5465	+ 0 0.4	+ 0 0.63	+ 0	28	4	52	2648
0.5	+ 0 0.7225	+ 0 0.6	+ 0 0.824	+ 0 0.7	+ 0 0.9345	+ 0	28	4	52	2649
0.8	+ 0 1.054	+ 0 0.9	+ 0 1.1825	+ 0 1.0	+ 0 1.320	+ 0	28	4	52	2650
0.0	+ 0 2.0	+ 7	0	0	1	21	28	4	52	2651
	21	2	0	0	0	0	28	4	52	2652
-1.0	+ 0 0.23	+ 0-0.9	+ 0 0.19225	+ 0-0.8	+ 0 0.165	+ 0	28	4	52	2653
-0.7	+ 0 0.14825	+ 0-0.6	+ 0 0.142	+ 0-0.5	+ 0 0.14625	+ 0	28	4	52	2654
-0.4	+ 0 0.161	+ 0-0.3	+ 0 0.18625	+ 0-0.2	+ 0 0.222	+ 0	28	4	52	2655
-0.1	+ 0 0.26825	+ 0 0.0	+ 0 0.325	+ 0 0.1	+ 0 0.39225	+ 0	28	4	52	2656
0.2	+ 0 0.47	+ 0 0.3	+ 0 0.55825	+ 0 0.4	+ 0 0.657	+ 0	28	4	52	2657
0.5	+ 0 0.76625	+ 0 0.6	+ 0 0.866	+ 0 0.7	+ 0 1.01625	+ 0	28	4	52	2658
0.8	+ 0 1.157	+ 0 0.9	+ 0 1.3825	+ 0 1.0	+ 0 1.47	+ 0	28	4	52	2659
0.0	+ 0 0.0	+ 0					28	4	0	2660
2.8	+ 4 5.81826	+ 1	0	2	0	0	28	4	53	2661
0.0	+ 0 5.81826	+ 1	0	2	0	0	28	4	53	2662
0.0	+ 0 0.0	+ 0	0	0	1	5	28	4	53	2663
	5	2	0	0	0	0	28	4	53	2664
0.0	+ 0 1.479	+ 6	0	0	1	2	28	4	53	2665
	2	2	0	0	0	0	28	4	53	2666
-1.0	+ 0 5.0	- 1 1.0	+ 0 5.0	- 1 0.0	+ 0 0.0	+ 0	28	4	53	2667
0.0	+ 0 4.0	+ 6	0	0	1	2	28	4	53	2668
	2	2	0	0	0	0	28	4	53	2669
-1.0	+ 0 5.0	- 1 1.0	+ 0 5.0	- 1 0.0	+ 0 0.0	+ 0	28	4	53	2670
0.0	+ 0 6.0	+ 6	0	0	1	21	28	4	53	2671
	21	2	0	0	0	0	28	4	53	2672
-1.0	+ 0 .425	+ 0-0.9	+ 0 0.3955	+ 0-0.8	+ 0 0.372	+ 0	28	4	53	2673
-0.7	+ 0 .3545	+ 0-0.6	+ 0 0.3430	+ 0-0.5	+ 0 0.3375	+ 0	28	4	53	2674
-0.4	+ 0 .338	+ 0-0.3	+ 0 0.3445	+ 0-0.2	+ 0 0.357	+ 0	28	4	53	2675
-0.1	+ 0 .3755	+ 0 0.0	+ 0 0.4006	+ 0 0.1	+ 0 0.4305	+ 0	28	4	53	2676
.2	+ 0 .467	+ 0 0.3	+ 0 0.5095	+ 0 0.4	+ 0 0.558	+ 0	28	4	53	2677
.5	+ 0 .6125	+ 0 0.6	+ 0 0.6730	+ 0 0.7	+ 0 0.7395	+ 0	28	4	53	2678
.8	+ 0 .8120	+ 0 0.9	+ 0 0.8905	+ 0 1.0	+ 0 0.9750	+ 0	28	4	53	2679
0.0	+ 0 1.4	+ 7	0	0	1	21	28	4	53	2680
	21	2	0	0	0	0	28	4	53	2681
-1.0	+ 0 0.28	+ 0-0.9	+ 0 0.24650	+ 0-0.8	+ 0 0.22200	+ 0	28	4	53	2682
-0.7	+ 0 0.2065	+ 0-0.6	+ 0 0.2	+ 0-0.5	+ 0 0.2025	+ 0	28	4	53	2683
-0.4	+ 0 0.214	+ 0-0.3	+ 0 0.2345	+ 0-0.2	+ 0 0.264	+ 0	28	4	53	2684
-0.1	+ 0 0.3025	+ 0 0.0	+ 0 0.35	+ 0 0.1	+ 0 0.4065	+ 0	28	4	53	2685
0.2	+ 0 0.472	+ 0 0.3	+ 0 0.5465	+ 0 0.4	+ 0 0.63	+ 0	28	4	53	2686
0.5	+ 0 0.7225	+ 0 0.6	+ 0 0.824	+ 0 0.7	+ 0 0.9345	+ 0	28	4	53	2687
0.8	+ 0 1.054	+ 0 0.9	+ 0 1.1825	+ 0 1.0	+ 0 1.320	+ 0	28	4	53	2688
0.0	+ 0 2.0	+ 7	0	0	1	21	28	4	53	2689
	21	2	0	0	0	0	28	4	53	2690
-1.0	+ 0 0.23	+ 0-0.9	+ 0 0.19225	+ 0-0.8	+ 0 0.165	+ 0	28	4	53	2691
-0.7	+ 0 0.14825	+ 0-0.6	+ 0 0.142	+ 0-0.5	+ 0 0.14625	+ 0	28	4	53	2692
-0.4	+ 0 0.161	+ 0-0.3	+ 0 0.18625	+ 0-0.2	+ 0 0.222	+ 0	28	4	53	2693
-0.1	+ 0 0.26825	+ 0 0.0	+ 0 0.325	+ 0 0.1	+ 0 0.39225	+ 0	28	4	53	2694
0.2	+ 0 0.47	+ 0 0.3	+ 0 0.55825	+ 0 0.4	+ 0 0.657	+ 0	28	4	53	2695
0.5	+ 0 0.76625	+ 0 0.6	+ 0 0.886	+ 0 0.7	+ 0 1.01625	+ 0	28	4	53	2696
0.8	+ 0 1.157	+ 0 0.9	+ 0 1.3825	+ 0 1.0	+ 0 1.47	+ 0	28	4	53	2697
0.0	+ 0 0.0	+ 0					28	4	0	2698
2.8	+ 4 5.81826	+ 1	0	2	0	0	28	4	54	2699

0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	54	2700
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	54	2701
	2		2		0		0		0		0	28	4	54	2702
0.0	+ 0	2.195	+ 6		0		0		1		2	28	4	54	2703
	2		2		0		0		0		0	28	4	54	2704
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	54	2705
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	54	2706
	2		2		0		0		0		0	28	4	54	2707
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	54	2708
0.0	+ 0	0.0	+ 0									28	4	0	2709
2.0	+ 4	5.81826	+ 1		0		2		0		0	28	4	55	2710
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	55	2711
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	55	2712
	2		2		0		0		0		0	28	4	55	2713
0.0	+ 0	2.324	+ 6		0		0		1		2	28	4	55	2714
	2		2		0		0		0		0	28	4	55	2715
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	55	2716
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	55	2717
	2		2		0		0		0		0	28	4	55	2718
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	55	2719
0.0	+ 0	0.0	+ 0									28	4	0	2720
2.0	+ 4	5.81826	+ 1		0		2		0		0	28	4	56	2721
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	56	2722
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	56	2723
	2		2		0		0		0		0	28	4	56	2724
0.0	+ 0	2.5	+ 6		0		0		1		2	28	4	56	2725
	2		2		0		0		0		0	28	4	56	2726
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	56	2727
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	56	2728
	2		2		0		0		0		0	28	4	56	2729
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	56	2730
0.0	+ 0	0.0	+ 0									28	4	0	2731
2.0	+ 4	5.81826	+ 1		0		2		0		0	28	4	57	2732
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	57	2733
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	57	2734
	2		2		0		0		0		0	28	4	57	2735
0.0	+ 0	2.548	+ 6		0		0		1		2	28	4	57	2736
	2		2		0		0		0		0	28	4	57	2737
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	57	2738
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	57	2739
	2		2		0		0		0		0	28	4	57	2740
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	57	2741
0.0	+ 0	0.0	+ 0									28	4	0	2742
2.8	+ 4	5.81826	+ 1		0		2		0		0	28	4	58	2743
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	58	2744
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	58	2745
	2		2		0		0		0		0	28	4	58	2746
0.0	+ 0	2.67	+ 6		0		0		1		2	28	4	58	2747
	2		2		0		0		0		0	28	4	58	2748
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	58	2749
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	58	2750
	2		2		0		0		0		0	28	4	58	2751
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	58	2752
0.0	+ 0	0.0	+ 0									28	4	0	2753
2.0	+ 4	5.81826	+ 1		0		2		0		0	28	4	59	2754
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	59	2755
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	59	2756
	2		2		0		0		0		0	28	4	59	2757
0.0	+ 0	2.822	+ 6		0		0		1		2	28	4	59	2758
	2		2		0		0		0		0	28	4	59	2759

-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	59	2760
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	59	2761
	2		2		0		0		0		0	28	4	59	2762
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	59	2763
0.0	+ 0	0.0	+ 0									28	4	0	2764
2.8	+ 4	5.81826	+ 1		0		2		0		0	28	4	60	2765
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	60	2766
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	60	2767
	2		2		0		0		0		0	28	4	60	2768
0.0	+ 0	3.01	+ 6		0		0		1		2	28	4	60	2769
	2		2		0		0		0		0	28	4	60	2770
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	60	2771
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	60	2772
	2		2		0		0		0		0	28	4	60	2773
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	60	2774
0.0	+ 0	0.0	+ 0									28	4	0	2775
2.8	+ 4	5.81826	+ 1		0		2		0		0	28	4	61	2776
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	61	2777
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	61	2778
	2		2		0		0		0		0	28	4	61	2779
0.0	+ 0	3.325	+ 6		0		0		1		2	28	4	61	2780
	2		2		0		0		0		0	28	4	61	2781
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	61	2782
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	61	2783
	2		2		0		0		0		0	28	4	61	2784
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	61	2785
0.0	+ 0	0.0	+ 0									28	4	0	2786
2.8	+ 4	5.81826	+ 1		0		2		0		0	28	4	62	2787
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	62	2788
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	62	2789
	2		2		0		0		0		0	28	4	62	2790
0.0	+ 0	3.689	+ 6		0		0		1		2	28	4	62	2791
	2		2		0		0		0		0	28	4	62	2792
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	62	2793
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	62	2794
	2		2		0		0		0		0	28	4	62	2795
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	62	2796
0.0	+ 0	0.0	+ 0									28	4	0	2797
2.8	+ 4	5.81826	+ 1		0		2		0		0	28	4	91	2798
0.0	+ 0	5.81826	+ 1		0		2		0		0	28	4	91	2799
0.0	+ 0	0.0	+ 0		0		0		1		2	28	4	91	2800
	2		2		0		0		0		0	28	4	91	2801
0.0	+ 0	3.763	+ 6		0		0		1		2	28	4	91	2802
	2		2		0		0		0		0	28	4	91	2803
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	91	2804
0.0	+ 0	2.0	+ 7		0		0		1		2	28	4	91	2805
	2		2		0		0		0		0	28	4	91	2806
-1.0	+ 0	5.0	- 1	1.0	+ 0	5.0	- 1	0.0	+ 0	0.0	+ 0	28	4	91	2807
0.0	+ 0	0.0	+ 0									28	4	0	2808
0.0	+ 0	0.0	+ 0									28	0	0	2809
2.8	+ 4	5.81826	+ 1		0		0		1		0	28	5	16	2810
7.954	+ 6	0.0	+ 0		0		9		1		2	28	5	16	2811
	2		2		0		0		0		0	28	5	16	2812
7.954	+ 6	1.0	+ 0	2.0	+ 7	1.0	+ 0					28	5	16	2813
0.0	+ 0	0.0	+ 0		0		0		1		7	28	5	16	2814
	7		2									28	5	16	2815
7.954	+ 6	1.0	+ 4	1.0	+ 7	3.6	+ 5	1.2	+ 7	5.00	+ 5	28	5	16	2816
1.4	+ 7	6.10	+ 5	1.6	+ 7	7.1	+ 5	1.8	+ 7	7.9	+ 5	28	5	16	2817
2.0	+ 7	8.7	+ 5									28	5	16	2818
0.0	+ 0	0.0	+ 0									28	5	0	2819

2.8 + 4	5.81826+ 1	0	0	1	0	28	5	22	2820
6.401 + 6	0.0 + 0	0	9	1	2	28	5	22	2821
2	2					28	5	22	2822
6.401 + 6	1.0 + 0	2.0 + 7	1. + 0			28	5	22	2823
0.0 + 0	0.0 + 0	0	0	1	4	28	5	22	2824
4	2					28	5	22	2825
6.401 + 6	1.0 + 4	1.0 + 7	4.7 + 5	1.5 + 7	7.3 + 5	28	5	22	2826
2.8 + 7	9.2 + 5					28	5	22	2827
						28	5	0	2828
2.8 + 4	5.81826+ 1	0	0	1	0	28	5	28	2829
8.319 + 6	0.0 + 0	0	9	1	2	28	5	28	2830
2	2					28	5	28	2831
8.319 + 6	1.0 + 0	2.0 + 7	1.0 + 0			28	5	28	2832
0.0 + 0	0.0 + 0	0	0	1	4	28	5	28	2833
4	2					28	5	28	2834
8.319 + 6	1.0 + 4	1.0 + 7	3.2 + 5	1.5 + 7	6.5 + 5	28	5	28	2835
2.8 + 7	8.5 + 5					28	5	28	2836
						28	5	0	2837
2.8 + 4	5.81826+ 1	0	0	1	0	28	5	91	2838
0.0 + 0	0.0 + 0	0	1	1	2	28	5	91	2839
2	2					28	5	91	2840
3.763 + 6	1.0 + 0	2.0 + 7	1.0 + 0			28	5	91	2841
0.0 + 0	0.0 + 0	0	0	1	11	28	5	91	2842
11	1					28	5	91	2843
.00000E 00	.37630E 07	0	1	1	22	28	5	91	2844
22	2					28	5	91	2845
.10000E-04	.00000E 00	.15000E 05	.43540E-06	.30000E 05	.85170E-06	28	5	91	2846
.45000E 05	.12500E-05	.60000E 05	.16300E-05	.75000E 05	.19920E-05	28	5	91	2847
.90000E 05	.23390E-05	.10500E 06	.26690E-05	.12000E 06	.29630E-05	28	5	91	2848
.13500E 06	.32830E-05	.15000E 06	.35680E-05	.16500E 06	.38390E-05	28	5	91	2849
.18000E 06	.40960E-05	.19500E 06	.43410E-05	.21000E 06	.45730E-05	28	5	91	2850
.22500E 06	.47930E-05	.24000E 06	.50010E-05	.25500E 06	.51970E-05	28	5	91	2851
.27000E 06	.53830E-05	.28500E 06	.55590E-05	.30000E 06	.57240E-05	28	5	91	2852
.30000E 06	.00000E 00	.00000E 00	.00000E 00	.00000E 00	.00000E 00	28	5	91	2853
.00000E 00	.40000E 07	0	1	1	22	28	5	91	2854
22	2					28	5	91	2855
.10000E-04	.00000E 00	.15000E 05	.43540E-06	.30000E 05	.85170E-06	28	5	91	2856
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.90000E 05	.23390E-05	.10500E 06	.26690E-05	.12000E 06	.29830E-05	28	5	91	2858
.13500E 06	.32830E-05	.15000E 06	.35680E-05	.16500E 06	.38390E-05	28	5	91	2859
.18000E 06	.40960E-05	.19500E 06	.43410E-05	.21000E 06	.45730E-05	28	5	91	2860
.22500E 06	.47930E-05	.24000E 06	.50010E-05	.25500E 06	.51970E-05	28	5	91	2861
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.19200E 06	.94980E-06	.22400E 06	.10570E-05	.25600E 06	.11530E-05	28	5	91	2868
.28800E 06	.12370E-05	.32000E 06	.13120E-05	.35200E 06	.13770E-05	28	5	91	2869
.38400E 06	.14330E-05	.41600E 06	.14810E-05	.44800E 06	.15230E-05	28	5	91	2870
.48000E 06	.15570E-05	.51200E 06	.15850E-05	.54400E 06	.16070E-05	28	5	91	2871
.57600E 06	.16240E-05	.60800E 06	.16370E-05	.64000E 06	.16450E-05	28	5	91	2872
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.76800E 06	.16400E-05	.80000E 06	.16310E-05	.80000E 06	.00000E 00	28	5	91	2874
.00000E 00	.50000E 07	0	1	1	32	28	5	91	2875
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.00000E 00	.60000E 07	0	1	1	32	28	5	91	2888
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.20700E 07	.34300E-06	.21470E 07	.32730E-06	.22230E 07	.31220E-06	28	5	91	2899
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.00000E 00	.50000E 07	0	1	1	42	28	5	91	2901
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.00000E 00	.10000E 08	0	1	1	42	28	5	91	2917
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.18900E 07	.26720E-06	.20470E 07	.25150E-06	.22050E 07	.23560E-06	28	5	91	2923
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.00000E 00	.12000E 08	0	1	1	51	28	5	91	2933
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.88560E 07	.22690E-07	.91020E 07	.21770E-07	.93480E 07	.20950E-07	28	5	91	2985
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.29340E 07	.16150E-06	.32600E 07	.14600E-06	.35860E 07	.13100E-06	28	5	91	2996
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.58680E 07	.56250E-07	.61940E 07	.49950E-07	.65200E 07	.44500E-07	28	5	91	2999

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0.00000+ 0	0.00000+ 0	0	0	0	0	28	0	0	3012
2.0000E+04	5.8165E+01	1		1		28	12	102	3013
0.	0.		1	1	2	28	12	102	3014
2	2					28	12	102	3015
1.0000E-05	1.4400E+00	2.0000E+07	4.6400E+00			28	12	102	3016
						28	12	0	3017
						28	0	0	3018
2.0000E+04	5.8165E+01			19		28	13	3	3019
				1	46	28	13	3	3020
46	2					28	13	3	3021
1.1920E+06	0.	1.3550E+06	1.5877E-02	1.4000E+06	9.1260E-02	28	13	3	3022
1.4500E+06	1.4513E-01	1.4790E+06	1.5955E-01	1.5000E+06	3.2600E-01	28	13	3	3023
1.5500E+06	2.8096E-01	1.6000E+06	3.0360E-01	1.6500E+06	4.1470E-01	28	13	3	3024
1.7000E+06	3.7760E-01	1.7500E+06	4.3450E-01	1.8000E+06	4.9040E-01	28	13	3	3025
1.8500E+06	4.2160E-01	1.9000E+06	4.5720E-01	2.0000E+06	5.9900E-01	28	13	3	3026
2.1950E+06	6.0046E-01	2.2000E+06	6.1140E-01	2.2500E+06	6.3537E-01	28	13	3	3027
2.3240E+06	7.1579E-01	2.4000E+06	8.1550E-01	2.5000E+06	8.7965E-01	28	13	3	3028
2.5480E+06	9.2259E-01	2.6000E+06	9.7400E-01	2.6700E+06	1.0115E+00	28	13	3	3029
2.[illegible]E+06	1.1012E+00	2.8220E+06	1.1183E+00	2.9000E+06	1.2369E+00	28	13	3	3030
3.0000E+06	1.3466E+00	3.0100E+06	1.3547E+00	3.1100E+06	1.5358E+00	28	13	3	3031
3.2000E+06	1.6376E+00	3.2500E+06	1.6569E+00	3.3250E+06	1.6718E+00	28	13	3	3032
3.4000E+06	1.7317E+00	3.5000E+06	1.8495E+00	3.5500E+06	1.6546E+00	28	13	3	3033
3.6000E+06	1.8572E+00	3.6890E+06	1.9123E+00	3.7500E+06	2.0201E+00	28	13	3	3034
3.9999E+06	2.1519E+00	4.0000E+06	2.1519E+00	6.0000E+06	3.6500E+00	28	13	3	3035
8.0000E+06	4.6100E+00	1.2000E+07	3.7500E+00	1.4000E+07	2.7600E+00	28	13	3	3036
2.0000E+07	2.7500E+00					28	13	3	3037
3.2700E+06	0.		2	1	5	28	13	3	3038
5	2					28	13	3	3039
3.3250E+06	0.	3.5000E+06	6.9300E-02	3.7500E+06	1.0710E-01	28	13	3	3040
3.9999E+06	1.1340E-01	4.0000E+06	0.			28	13	3	3041
2.9600E+06	0.		2	1	7	28	13	3	3042
7	2					28	13	3	3043
3.0100E+06	0.	3.1100E+06	5.0000E-03	3.2500E+06	7.3000E-03	28	13	3	3044
3.5000E+06	9.3000E-03	3.7500E+06	9.8000E-03	3.9999E+06	9.3000E-03	28	13	3	3045
4.0000E+06	0.					28	13	3	3046
2.7750E+06	0.		2	1	8	28	13	3	3047
8	2					28	13	3	3048
2.8220E+06	0.	2.9600E+06	2.3000E-03	3.0000E+06	3.6000E-03	28	13	3	3049
3.2500E+06	5.0000E-03	3.5000E+06	5.6000E-03	3.7500E+06	5.6000E-03	28	13	3	3050
3.9999E+06	5.3000E-03	4.0000E+06	0.			28	13	3	3051
2.1740E+06	0.		2	1	4	28	13	3	3052
4	2					28	13	3	3053
3.6890E+06	0.	3.7500E+06	8.5000E-03	3.9999E+06	2.1300E-02	28	13	3	3054
4.0000E+06	0.					28	13	3	3055
2.1980E+06	0.		2	1	9	28	13	3	3056
9	2					28	13	3	3057
2.1950E+06	0.	2.2000E+06	9.0000E-04	2.4000E+06	5.4000E-03	28	13	3	3058
2.6000E+06	7.2000E-03	2.8000E+06	9.0000E-03	3.0000E+06	1.0900E-02	28	13	3	3059

3.5000E+06	1.0600E-02	3.9999E+06	8.7000E-03	4.0000E+06	0.	2813	3	3060
1.5160E+06	0.		2	1	5	2813	3	3061
5	2					2813	3	3062
3.3250E+06	0.	3.5000E+06	4.0700E-02	3.7500E+06	6.2900E-02	2813	3	3063
3.9999E+06	6.0600E-02	4.0000E+06	0.			2813	3	3064
1.5060E+06	0.		2	1	7	2813	3	3065
7	2					2813	3	3066
3.0100E+06	0.	3.1100E+06	9.5000E-02	3.2500E+06	1.3760E-01	2813	3	3067
3.5000E+06	1.7560E-01	3.7500E+06	1.8530E-01	3.9999E+06	1.7500E-01	2813	3	3068
4.0000E+06	0.					2813	3	3069
1.4540E+06	0.		2	1	22	2813	3	3070
22	2					2813	3	3071
1.4790E+06	0.	1.5000E+06	2.5000E-01	1.5500E+06	1.1500E-01	2813	3	3072
1.6000E+06	1.5000E-01	1.6500E+06	2.6000E-01	1.7000E+06	2.6000E-01	2813	3	3073
1.7500E+06	2.6000E-01	1.8000E+06	3.2000E-01	1.6500E+06	2.5500E-01	2813	3	3074
1.9000E+06	2.5000E-01	2.0000E+06	3.6000E-01	2.2500E+06	3.7000E-01	2813	3	3075
2.4000E+06	4.4000E-01	2.6000E+06	4.8390E-01	2.3000E+06	5.1000E-01	2813	3	3076
3.0000E+06	5.5240E-01	3.2000E+06	7.1570E-01	3.4000E+06	7.1640E-01	2813	3	3077
3.5000E+06	7.5690E-01	3.6000E+06	7.5400E-01	3.9999E+06	8.8100E-01	2813	3	3078
4.0000E+06	0.					2813	3	3079
1.3330E+06	0.		2	1	21	2813	3	3080
21	2					2813	3	3081
1.3550E+06	0.	1.4000E+06	7.1000E-02	1.4500E+06	1.2000E-01	2813	3	3082
1.5000E+06	1.4500E-01	1.5500E+06	1.3500E-01	1.6000E+06	1.2200E-01	2813	3	3083
1.6500E+06	1.2200E-01	1.7000E+06	1.4400E-01	1.7500E+06	1.2000E-01	2813	3	3084
1.8000E+06	1.3500E-01	1.6500E+06	1.3000E-01	1.9000E+06	1.7000E-01	2813	3	3085
2.0000E+06	1.8000E-01	2.2000E+06	1.8910E-01	2.4000E+06	2.5810E-01	2813	3	3086
2.6000E+06	2.9670E-01	2.8000E+06	3.2100E-01	3.0000E+06	3.3640E-01	2813	3	3087
3.5000E+06	3.0260E-01	3.9999E+06	2.4100E-01	4.0000E+06	0.	2813	3	3088
1.3210E+06	0.		2	1	8	2813	3	3089
8	2					2813	3	3090
2.3220E+06	0.	2.9000E+06	5.5700E-02	3.0000E+06	8.6400E-02	2813	3	3091
3.2500E+06	1.2000E-01	3.5500E+06	1.3440E-01	3.7500E+06	1.3440E-01	2813	3	3092
3.9999E+06	1.2670E-01	4.0000E+06	0.			2813	3	3093
1.2920E+06	0.		2	1	6	2813	3	3094
6	2					2813	3	3095
2.0700E+06	0.	2.5000E+06	6.0000E-03	3.0000E+06	1.5500E-02	2813	3	3096
3.5000E+06	1.6200E-02	3.9999E+06	1.5900E-02	4.0000E+06	0.	2813	3	3097
1.1730E+06	0.		2	1	9	2813	3	3098
9	2					2813	3	3099
2.5480E+06	0.	2.6000E+06	4.9000E-03	2.8000E+06	9.9000E-03	2813	3	3100
3.0000E+06	1.3300E-02	3.2000E+06	1.5700E-02	3.4000E+06	1.6900E-02	2813	3	3101
3.5000E+06	1.7400E-02	3.9999E+06	1.5700E-02	4.0000E+06	0.	2813	3	3102
1.1720E+06	0.		2	1	7	2813	3	3103
7	2					2813	3	3104
1.1920E+06	0.	1.5000E+06	3.0000E-02	2.0000E+06	3.9000E-02	2813	3	3105
2.5000E+06	4.0000E-02	3.0000E+06	3.7000E-02	3.9999E+06	2.0000E-02	2813	3	3106
4.0000E+06	0.					2813	3	3107
1.1690E+06	0.		2	1	4	2813	3	3108
4	2					2813	3	3109
3.6690E+06	0.	3.7500E+06	4.1500E-02	3.9999E+06	1.0350E-01	2813	3	3110
4.0000E+06	0.					2813	3	3111
1.0050E+06	0.		2	1	9	2813	3	3112
9	2					2813	3	3113
2.5000E+06	0.	2.6000E+06	2.5900E-02	2.8000E+06	5.0000E-02	2813	3	3114
3.0000E+06	6.6000E-02	3.2000E+06	7.9700E-02	3.4000E+06	8.5000E-02	2813	3	3115
3.6000E+06	6.7000E-02	3.9999E+06	1.6280E-01	4.0000E+06	0.	2813	3	3116
9.5300E+05	0.		2	1	8	2813	3	3117
8	2					2813	3	3118
2.3240E+06	0.	2.4000E+06	2.0000E-02	2.6000E+06	4.2000E-02	2813	3	3119

2.5000E+06	5.5100E-02	3.0000E+06	5.5000E-02	3.5000E+06	5.4000E-02	2813	3	3120
3.9999E+06	4.3000E-02	4.0000E+06	0.			2813	3	3121
6.2500E+05	0.		1	1	9	2813	3	3122
9	2					2813	3	3123
2.1950E+06	0.	2.2000E+06	1.0000E-02	2.4000E+06	6.0000E-02	2813	3	3124
2.6000E+06	6.0000E-02	2.8000E+06	9.0100E-02	3.0000E+06	1.1060E-01	2813	3	3125
3.5000E+06	1.0720E-01	3.9999E+06	8.6400E-02	4.0000E+06	0.	2813	3	3126
4.6700E+06	0.		2	1	6	2813	3	3127
6	2					2813	3	3128
2.6700E+06	0.	2.6800E+06	1.4000E-02	3.0000E+06	3.1500E-02	2813	3	3129
3.5000E+06	3.7600E-02	3.9999E+06	3.7100E-02	4.0000E+06	0.	2813	3	3130
0.	0.		1	1	7	2813	3	3131
7	2					2813	3	3132
3.9999E+06	0.	4.0000E+06	2.1519E+00	6.0000E+06	3.6800E+00	2813	3	3133
8.0000E+06	4.6100E+00	1.2000E+07	3.7500E+00	1.4000E+07	2.7600E+00	2813	3	3134
2.0000E+07	2.7500E+00					2813	3	3135
						2813	0	3136
						28 0	0	3137
2.5000E+04	5.5185E+01	1		19		2814	3	3138
						2814	0	3139
2.5000E+04	5.5185E+01	1		1		2814	102	3140
						2814	0	3141
						28 0	0	3142
2.5000E+04	5.5185E+01			1		2815	3	3143
0.		0	1	1	2	2815	3	3144
2	2					2815	3	3145
3.9999E+06	1.0000E+00	2.0000E+07	1.0000E+00			2815	3	3146
				1	6	2815	3	3147
6	2					2815	3	3148
0.	3.9999E+06	0		1	10	2815	3	3149
10	1					2815	3	3150
7.5000E+05	6.3800E-07	1.0000E+06	5.7500E-07	1.2500E+06	1.0833E-06	2815	3	3151
1.5000E+06	2.3575E-07	1.7500E+06	1.6365E-07	2.0000E+06	9.4165E-08	2815	3	3152
2.5000E+06	4.2212E-08	3.0000E+06	6.7216E-09	3.5000E+06	2.2336E-08	2815	3	3153
4.0000E+06	0.					2815	3	3154
0.	6.0000E+06	0		1	16	2815	3	3155
16	1					2815	3	3156
2.5000E+05	1.3630E-07	5.0000E+05	2.7261E-07	7.5000E+05	5.1796E-07	2815	3	3157
1.0000E+06	5.4796E-07	1.2500E+06	1.2526E-06	1.5000E+06	2.4760E-07	2815	3	3158
1.7500E+06	1.6401E-07	2.0000E+06	1.2336E-07	2.5000E+06	1.3973E-07	2815	3	3159
3.0000E+06	9.1324E-08	3.5000E+06	3.6802E-08	4.0000E+06	2.3922E-08	2815	3	3160
4.5000E+06	7.4968E-09	5.0000E+06	5.2474E-09	5.5000E+06	2.5598E-09	2815	3	3161
6.0000E+06	0.					2815	3	3162
0.	6.5000E+06	0		1	20	2815	3	3163
20	1					2815	3	3164
2.5000E+05	1.1730E-07	5.0000E+05	2.3460E-07	7.5000E+05	4.1876E-07	2815	3	3165
1.0000E+06	5.1344E-07	1.2500E+06	9.7592E-07	1.5000E+06	2.8738E-07	2815	3	3166
1.7500E+06	1.9472E-07	2.0000E+06	1.4193E-07	2.5000E+06	1.4562E-07	2815	3	3167
3.0000E+06	1.1554E-07	3.5000E+06	7.1552E-08	4.0000E+06	4.6098E-08	2815	3	3168
4.5000E+06	3.5952E-08	5.0000E+06	2.1758E-08	5.5000E+06	1.9002E-08	2815	3	3169
6.0000E+06	1.4076E-08	6.5000E+06	6.3342E-09	7.0000E+06	4.9652E-09	2815	3	3170
7.5000E+06	2.5306E-09	8.0000E+06	0.			2815	3	3171
0.	1.2300E+07	0		1	23	2815	3	3172
23	1					2815	3	3173
2.5000E+05	1.3355E-07	5.0000E+05	2.6710E-07	7.5000E+05	3.8596E-07	2815	3	3174
1.0000E+06	5.0216E-07	1.2500E+06	7.6928E-07	1.5000E+06	2.3238E-07	2815	3	3175
1.7500E+06	1.6560E-07	2.0000E+06	1.2954E-07	2.5000E+06	1.2687E-07	2815	3	3176
3.0000E+06	1.1085E-07	3.5000E+06	7.0782E-08	4.0000E+06	6.3504E-08	2815	3	3177
4.5000E+06	4.8814E-08	5.0000E+06	4.1200E-08	5.5000E+06	4.1400E-08	2815	3	3178
6.0000E+06	3.6126E-08	6.5000E+06	2.6978E-08	7.0000E+06	2.6110E-08	2815	3	3179

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7.5000E+06 1.6894E-08 8.0000E+06 1.4156E-08 8.5000E+06 4.7410E-09 2815  3 3180
9.0000E+06 4.9066E-09 9.5000E+06 0.                                2815  3 3181
0.         1.4000E+07          0          0          1         24 2815  3 3182
        24          2                                             2815  3 3183
2.5000E+05 1.8185E-07 5.0000E+05 3.6370E-07 7.5000E+05 3.9826E-07 2815  3 3184
1.0000E+06 5.3528E-07 1.2500E+06 8.0560E-07 1.5000E+06 2.4732E-07 2815  3 3185
1.7500E+06 1.7076E-07 2.0000E+06 1.2002E-07 2.5000E+06 1.0520E-07 2815  3 3186
3.0000E+06 1.0093E-07 3.5000E+06 5.8556E-08 4.0000E+06 3.9370E-08 2815  3 3187
4.5000E+06 4.7464E-08 5.0000E+06 2.7186E-08 5.5000E+06 3.4278E-08 2815  3 3188
6.0000E+06 3.4460E-08 6.5000E+06 1.6456E-08 7.0000E+06 1.9913E-08 2815  3 3189
7.5000E+06 1.4730E-08 8.0000E+06 1.4730E-08 8.5000E+06 3.1824E-09 2815  3 3190
9.0000E+06 2.9096E-09 9.5000E+06 2.7276E-09 1.0000E+07 0.         2815  3 3191
0.         2.0000E+07          0          0          1         24 2815  3 3192
        24          1                                             2815  3 3193
2.5000E+05 1.8111E-07 5.0000E+05 3.6222E-07 7.5000E+05 4.5900E-07 2815  3 3194
1.0000E+06 6.3268E-07 1.2500E+06 7.8059E-07 1.5000E+06 3.0789E-07 2815  3 3195
1.7500E+06 2.2276E-07 2.0000E+06 1.2497E-07 2.5000E+06 1.2134E-07 2815  3 3196
3.0000E+06 6.7565E-08 3.5000E+06 4.7270E-08 4.0000E+06 2.8706E-08 2815  3 3197
4.5000E+06 2.2458E-08 5.0000E+06 2.3364E-08 5.5000E+06 1.3855E-08 2815  3 3198
6.0000E+06 2.0466E-08 6.5000E+06 1.3493E-08 7.0000E+06 5.5238E-09 2815  3 3199
7.5000E+06 6.7916E-09 8.0000E+06 6.4294E-09 8.5000E+06 6.2484E-09 2815  3 3200
9.0000E+06 1.1772E-09 9.5000E+06 7.2443E-10 1.0000E+07 0.         2815  3 3201
                                                                  2815  0 3202
2.5000E+04 5.6185E+01                                1            2815102 3203
0.                                0          1          1          2 2815102 3204
         2          2                                             2815102 3205
1.0000E-05 1.0000E+00 2.0000E+07 1.0000E+00                       2815102 3206
                                                     1          2 2815102 3207
         2          2                                             2815102 3208
0.         1.0000E-05          0                     1         36 2815102 3209
        36          1                                             2815102 3210
2.5000E+05 5.9092E-07 5.0000E+05 0.         7.5000E+05 1.3659E-07 2815102 3211
1.0000E+06 4.1312E-08 1.2500E+06 3.9024E-08 1.5000E+06 1.9512E-08 2815102 3212
1.7500E+06 8.3624E-08 2.0000E+06 4.1812E-08 2.2500E+06 1.3937E-08 2815102 3213
2.5000E+06 5.5748E-08 2.7500E+06 5.5748E-08 3.0000E+06 2.7875E-08 2815102 3214
3.2500E+06 2.5087E-08 3.5000E+06 2.7875E-08 3.7500E+06 1.9512E-08 2815102 3215
4.0000E+06 1.6725E-08 4.2500E+06 1.6725E-08 4.5000E+06 2.5087E-08 2815102 3216
4.7500E+06 4.4600E-08 5.0000E+06 2.2300E-08 5.2500E+06 5.5748E-08 2815102 3217
5.5000E+06 2.7875E-08 5.7500E+06 1.0035E-07 6.0000E+06 6.9684E-08 2815102 3218
6.2500E+06 2.5087E-08 6.5000E+06 6.9684E-08 6.7500E+06 3.1220E-07 2815102 3219
7.0000E+06 0.         7.2500E+06 5.5748E-09 7.5000E+06 1.5889E-07 2815102 3220
7.7500E+06 2.2857E-07 8.0000E+06 9.4772E-08 8.2500E+06 5.5748E-09 2815102 3221
8.5000E+06 4.7388E-07 8.7500E+06 1.0676E-06 9.0000E+06 0.         2815102 3222
0.         2.0000E+07          0                     1         36 2815102 3223
        36          1                                             2815102 3224
2.5000E+05 5.9092E-07 5.0000E+05 0.         7.5000E+05 1.3659E-07 2815102 3225
1.0000E+06 4.1812E-08 1.2500E+06 3.9024E-08 1.5000E+06 1.9512E-08 2815102 3226
1.7500E+06 8.3624E-08 2.0000E+06 4.1812E-08 2.2500E+06 1.3937E-08 2815102 3227
2.5000E+06 5.5748E-08 2.7500E+06 5.5748E-08 3.0000E+06 2.7875E-08 2815102 3228
3.2500E+06 2.5087E-08 3.5000E+06 2.7875E-08 3.7500E+06 1.9512E-08 2815102 3229
4.0000E+06 1.6725E-08 4.2500E+06 1.6725E-08 4.5000E+06 2.5087E-08 2815102 3230
4.7500E+06 4.4600E-08 5.0000E+06 2.2300E-08 5.2500E+06 5.5748E-08 2815102 3231
5.5000E+06 2.7875E-08 5.7500E+06 1.0035E-07 6.0000E+06 6.9684E-08 2815102 3232
6.2500E+06 2.5087E-08 6.5000E+06 6.9684E-08 6.7500E+06 3.1220E-07 2815102 3233
7.0000E+06 0.         7.2500E+06 5.5748E-09 7.5000E+06 1.5889E-07 2815102 3234
7.7500E+06 2.2857E-07 8.0000E+06 9.4772E-08 8.2500E+06 5.5748E-09 2815102 3235
8.5000E+06 4.7388E-07 8.7500E+06 1.0676E-06 9.0000E+06 0.         2815102 3236
                                                                  2815  0 3237
                                                                  28 0  0 3238
                                                                  28 0  0 3239
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                                                                        28 0    0 3240
*EPF                                                                    28 0    0 3241
                                                                        28 0    0 3242
*********** ISOTOPIC REACTION FILES ***********                         28 0    0 3243
                                                                        28 0    0 3244
*********** NI-58 ISOTOPIC REACTION FILE ***********                    28 0    0 3245
2.80000+ 4 5.80000+ 1          0         99          0          0 28 3 16 3246
0.0000E+00-1.2203E+07          0          0          1         16 28 3 16 3247
        16          2          0          0          0          0 28 3 16 3248
.12410E 08 .00000E 00 .13000E 08 .40000E-02 .13500E 08 .13000E-01 28 3 16 3249
.14000E 08 .23000E-01 .14500E 08 .31000E-01 .15000E 08 .38000E-01 28 3 16 3250
.15500E 08 .42500E-01 .16000E 08 .46000E-01 .16500E 08 .49000E-01 28 3 16 3251
.17000E 08 .51500E-01 .17500E 08 .54000E-01 .18000E 08 .56500E-01 28 3 16 3252
.18500E 08 .58000E-01 .19000E 08 .61000E-01 .19500E 08 .63600E-01 28 3 16 3253
.20000E 08 .66000E-01 .00000E 00 .00000E 00 .00000E 00 .00000E 00 28 3 16 3254
.00000E 00 .00000E 00                                             28 3  0 3255
2.80000+ 4 5.80000+ 1          0         99          0          0 28 3 28 3256
0.0000E+00-8.1772E+06          0          0          1          7 28 3 28 3257
         7          2          0          0          0          0 28 3 28 3258
.83190E 07 .00000E 00 .10000E 08 .16000E 00 .12000E 08 .28400E 00 28 3 28 3259
.14500E 08 .55000E 00 .16000E 08 .68000E 00 .18000E 08 .80000E 00 28 3 28 3260
.20000E 08 .88000E 00 .11500E 08 .16400E-01 .12000E 08 .21000E-01 28 3 28 3261
.00000E 00 .00000E 00                                             28 3  0 3262
2.80000+ 4 5.80000+ 1          0         99          0          0 28 3103 3263
0.00000+ 0 3.94700+ 5          0          0          1         86 28 3103 3264
        86          2                                             28 3103 3265
.10000E 01 .00000E 00 .10000E 06 .26000E-05 .65000E 06 .28000E-05 28 3103 3266
.67000E 06 .12000E-04 .68000E 06 .23000E-04 .69000E 06 .34000E-04 28 3103 3267
.70000E 06 .44000E-04 .73000E 06 .61000E-04 .75000E 06 .11000E-03 28 3103 3268
.80000E 06 .19000E-03 .85000E 06 .30000E-03 .90000E 06 .46000E-03 28 3103 3269
.95000E 06 .65000E-03 .10000E 07 .10000E-02 .10400E 07 .15000E-02 28 3103 3270
.11000E 07 .25000E-02 .11400E 07 .33000E-02 .12000E 07 .42000E-02 28 3103 3271
.12600E 07 .50000E-02 .13000E 07 .55000E-02 .13400E 07 .65000E-02 28 3103 3272
.13600E 07 .75000E-02 .14000E 07 .90000E-02 .15000E 07 .12000E-01 28 3103 3273
.16000E 07 .15000E-01 .17000E 07 .20000E-01 .18000E 07 .26000E-01 28 3103 3274
.19000E 07 .33000E-01 .20000E 07 .39000E-01 .21000E 07 .46000E-01 28 3103 3275
.21900E 07 .53000E-01 .23000E 07 .75000E-01 .24000E 07 .93000E-01 28 3103 3276
.25000E 07 .10000E 00 .26000E 07 .11500E 00 .27000E 07 .13700E 00 28 3103 3277
.28000E 07 .15200E 00 .29000E 07 .17500E 00 .29400E 07 .19300E 00 28 3103 3278
.29600E 07 .19800E 00 .29800E 07 .19800E 00 .30000E 07 .19300E 00 28 3103 3279
.30400E 07 .18300E 00 .30800E 07 .18100E 00 .31200E 07 .18300E 00 28 3103 3280
.32000E 07 .21500E 00 .32600E 07 .23100E 00 .32800E 07 .23000E 00 28 3103 3281
.33200E 07 .22300E 00 .33400E 07 .22100E 00 .34000E 07 .24000E 00 28 3103 3282
.35000E 07 .27300E 00 .36000E 07 .30000E 00 .37000E 07 .31700E 00 28 3103 3283
.38000E 07 .33000E 00 .39000E 07 .34500E 00 .40000E 07 .35000E 00 28 3103 3284
.41000E 07 .36300E 00 .42000E 07 .38500E 00 .43000E 07 .40000E 00 28 3103 3285
.44000E 07 .41000E 00 .47000E 07 .41000E 00 .48000E 07 .42500E 00 28 3103 3286
.50000E 07 .45700E 00 .53000E 07 .50000E 00 .54000E 07 .52000E 00 28 3103 3287
.56000E 07 .56000E 00 .59000E 07 .57000E 00 .61000E 07 .58500E 00 28 3103 3288
.63000E 07 .60000E 00 .64000E 07 .61000E 00 .66000E 07 .62000E 00 28 3103 3289
.70000E 07 .63000E 00 .75000E 07 .63500E 00 .85000E 07 .63500E 00 28 3103 3290
.95000E 07 .63000E 00 .10500E 08 .61500E 00 .11500E 08 .58000E 00 28 3103 3291
.12250E 08 .53000E 00 .13000E 08 .45000E 00 .13500E 08 .39500E 00 28 3103 3292
.14000E 08 .33700E 00 .15000E 08 .24800E 00 .16000E 08 .18800E 00 28 3103 3293
.17000E 08 .16800E 00 .18000E 08 .15700E 00 .19000E 08 .15200E 00 28 3103 3294
.20000E 08 .15000E 00 .00000E 00 .00000E 00 .00000E 00 .00000E 00 28 3103 3295
.00000E 00 .00000E 00                                             28 3    0 3296
2.80000+ 4 5.80000+ 1          0         99          0          0 28 3104 3297
0.0000E+00-5.9520E+06          0          0          1          9 28 3104 3298
         9          2          0          0          0          0 28 3104 3299
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.60560E 07 .00000E 00 .75000E 07 .31000E-03 .80000E 07 .93000E-03 28 3104 3300
.13000E 08 .15200E-01 .14000E 08 .17700E-01 .15000E 08 .19200E-01 28 3104 3301
.16000E 08 .19500E-01 .18000E 08 .20500E-01 .20000E 08 .21000E-01 28 3104 3302
.00000E 00 .00000E 00                                              28 3   0 3303
2.80000+ 4 5.30000+ 1          0         99          0          0 28 3107 3304
0.00000+ 0 2.8[illegible]20+ 6          0          0          1         31 28 3107 3305
        31          2                                              28 3107 3306
.10000E 01 .00000E 00 .10000E 07 .46000E-02 .20000E 07 .90000E-02 28 3107 3307
.30000E 07 .15000E-01 .35000E 07 .20000E-01 .40000E 07 .25000E-01 28 3107 3308
.45000E 07 .32000E-01 .50000E 07 .40000E-01 .55000E 07 .52000E-01 28 3107 3309
.60000E 07 .65000E-01 .70000E 07 .85000E-01 .75000E 07 .94000E-01 28 3107 3310
.80000E 07 .10000E 00 .90000E 07 .11000E 00 .10000E 08 .11700E 00 28 3107 3311
.11000E 08 .12300E 00 .12000E 08 .12000E 00 .12500E 08 .11950E 00 28 3107 3312
.13000E 08 .11800E 00 .13500E 08 .11600E 00 .14000E 08 .11500E 00 28 3107 3313
.14500E 08 .10800E 00 .15000E 08 .10100E 00 .16500E 08 .80000E-01 28 3107 3314
.17000E 08 .72000E-01 .17500E 08 .66000E-01 .18000E 08 .60000E-01 28 3107 3315
.18500E 08 .54000E-01 .19000E 08 .50000E-01 .19500E 08 .45000E-01 28 3107 3316
.20000E 08 .40000E-01 .00000E 00 .00000E 00 .00000E 00 .00000E 00 28 3107 3317
.00000E 00 .00000E 00                                              28 3   0 3318
.00000E 00 .00000E 00                                              28 0   0 3319
                                                                   28 0   0 3320
                                                                   28 0   0 3321
                                                                   28 0   0 3322
*********** NI-60 ISOTOPIC REACTION FILE ***********
2.80000+ 4 6.00000+ 1          0         99          0          0 28 3  16 3323
0.0000E+00-1.1368E+07          0          0          1          7 28 3  16 3324
         7          2          0          0          0          0 28 3  16 3325
.11500E 08 .00000E 00 .12000E 08 .50000E-01 .13000E 08 .17500E 00 28 3  16 3326
.14000E 08 .29500E 00 .15000E 08 .36500E 00 .16000E 08 .44500E 00 28 3  16 3327
.20000E 08 .59000E 00 .00000E 00 .00000E 00 .00000E 00 .00000E 00 28 3  16 3328
.00000E 00 .00000E 00                                              28 3   0 3329
2.80000+ 4 6.00000+ 1          0         99          0          0 28 3  28 3330
0.0000E+00-9.5320E+06          0          0          1          6 28 3  28 3331
         6          2          0          0          0          0 28 3  28 3332
.96920E 07 .00000E 00 .12000E 08 .33900E-01 .14500E 08 .65000E-01 28 3  28 3333
.16000E 08 .80000E-01 .18000E 08 .93000E-01 .20000E 08 .10300E 00 28 3  28 3334
.00000E 00 .00000E 00                                              28 3   0 3335
2.80000+ 4 6.00000+ 1          0         99          0          0 28 3103 3336
0.00000+ 0-2.04000-06          0          0          1         32 28 3103 3337
        32          2                                              28 3103 3338
.20740E 07 .00000E 00 .21000E 07 .60000E-03 .22000E 07 .14000E-02 28 3103 3339
.23000E 07 .22000E-02 .25000E 07 .40000E-02 .30000E 07 .80000E-02 28 3103 3340
.35000E 07 .11000E-01 .40000E 07 .16000E-01 .45000E 07 .18000E-01 28 3103 3341
.50000E 07 .23000E-01 .55000E 07 .27000E-01 .60000E 07 .35000E-01 28 3103 3342
.65000E 07 .47000E-01 .70000E 07 .64000E-01 .75000E 07 .75000E-01 28 3103 3343
.80000E 07 .95000E-01 .85000E 07 .11900E 00 .90000E 07 .14600E 00 28 3103 3344
.95000E 07 .15500E 00 .10000E 08 .16000E 00 .10500E 08 .16100E 00 28 3103 3345
.11000E 08 .16000E 00 .11500E 08 .15800E 00 .12000E 08 .15300E 00 28 3103 3346
.13000E 08 .14200E 00 .14000E 08 .12600E 00 .15000E 08 .10900E 00 28 3103 3347
.16000E 08 .92000E-01 .17000E 08 .81000E-01 .18000E 08 .71000E-01 28 3103 3348
.19000E 08 .64000E-01 .20000E 08 .56000E-01 .00000E 00 .00000E 00 28 3103 3349
.00000E 00 .00000E 00                                              28 3   0 3350
2.80000+ 4 6.00000+ 1          0         99          0          0 28 3104 3351
0.0000E+00-7.3070E+06          0          0          1          9 28 3104 3352
         9          2          0          0          0          0 28 3104 3353
.74300E 07 .00000E 00 .75000E 07 .52000E-03 .80000E 07 .15700E-02 28 3104 3354
.13000E 08 .25000E-01 .14000E 08 .30000E-01 .15000E 08 .32400E-01 28 3104 3355
.16000E 08 .33400E-01 .18000E 08 .34600E-01 .20000E 08 .35400E-01 28 3104 3356
.00000E 00 .00000E 00                                              28 3   0 3357
2.80000+ 4 6.00000+ 1          0         99          0          0 28 3107 3358
0.00000+ 0 1.35200+ 6          0          0          1          9 28 3107 3359
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          9          2                                                                     28 3107 3360
 .10000E 01 .00000E 00 .60000E 07 .10000E-02 .80000E 07 .12000E-01  28 3107 3361
 .10000E 08 .30000E-01 .12000E 08 .55000E-01 .14000E 08 .75000E-01  28 3107 3362
 .16000E 08 .80000E-01 .18000E 08 .70000E-01 .20000E 08 .60000E-01  28 3107 3363
 .00000E 00 .00000E 00                                              28 3    0 3364
                                                                    28 0    0 3365
                                                                    28 0    0 3366
 *********** END OF ENTIRE FILE **********                          28 0    0 3367
*EOF
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Fig. 1

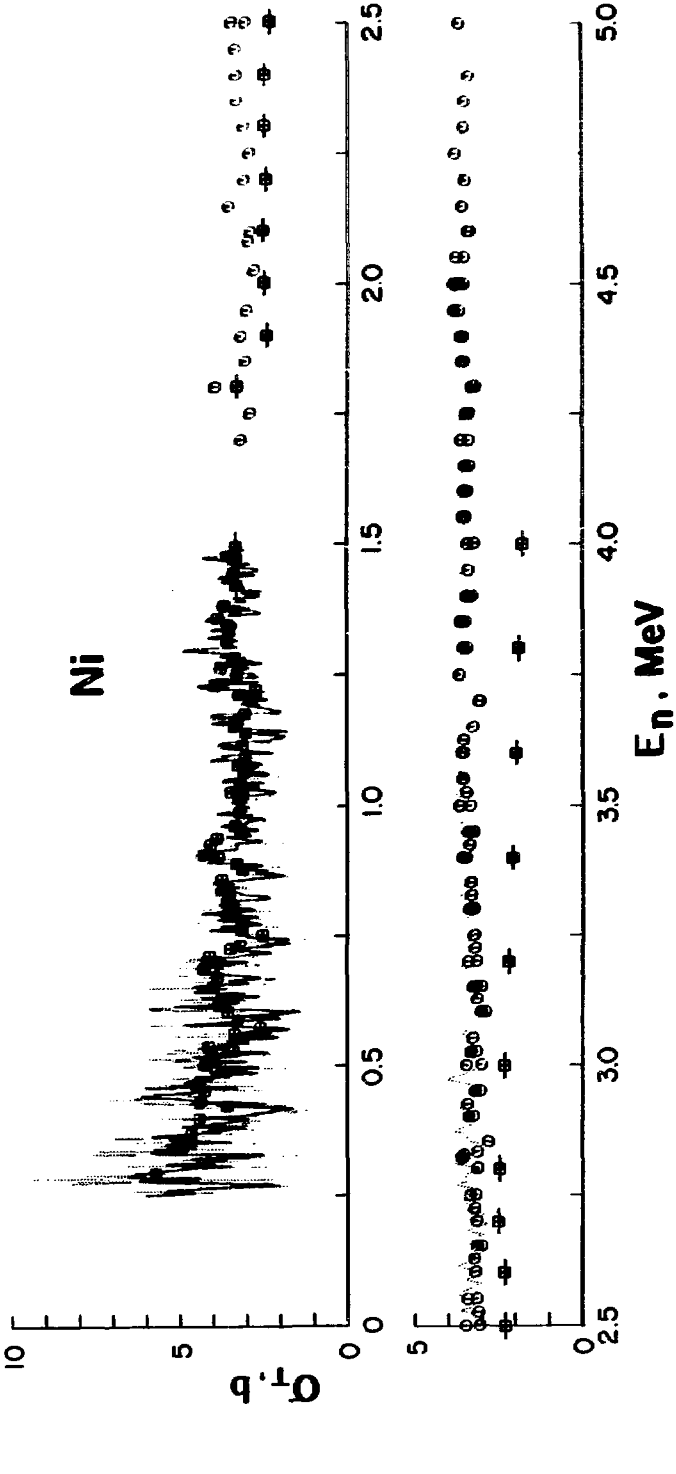


Fig. 2

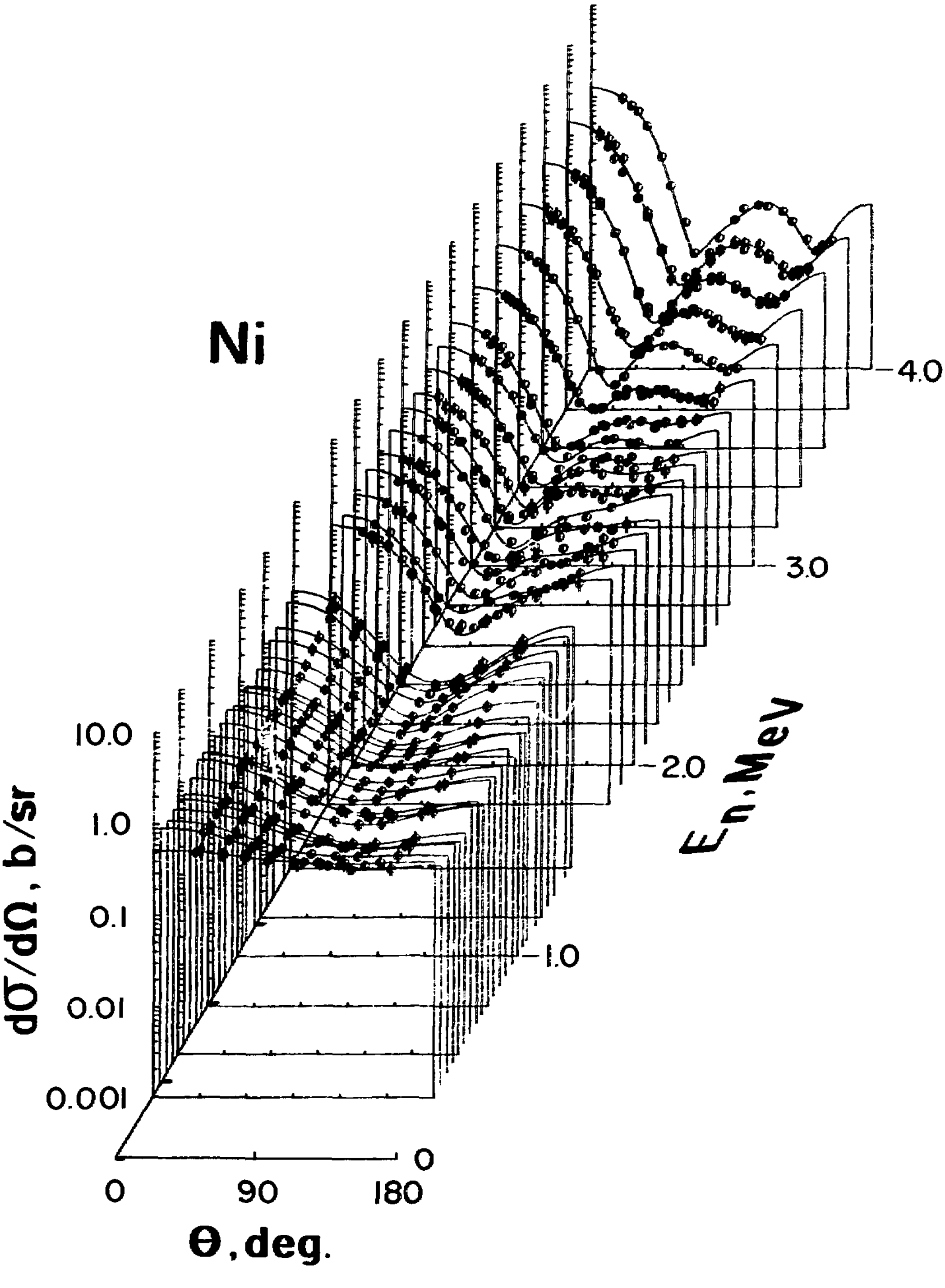


Fig. 3

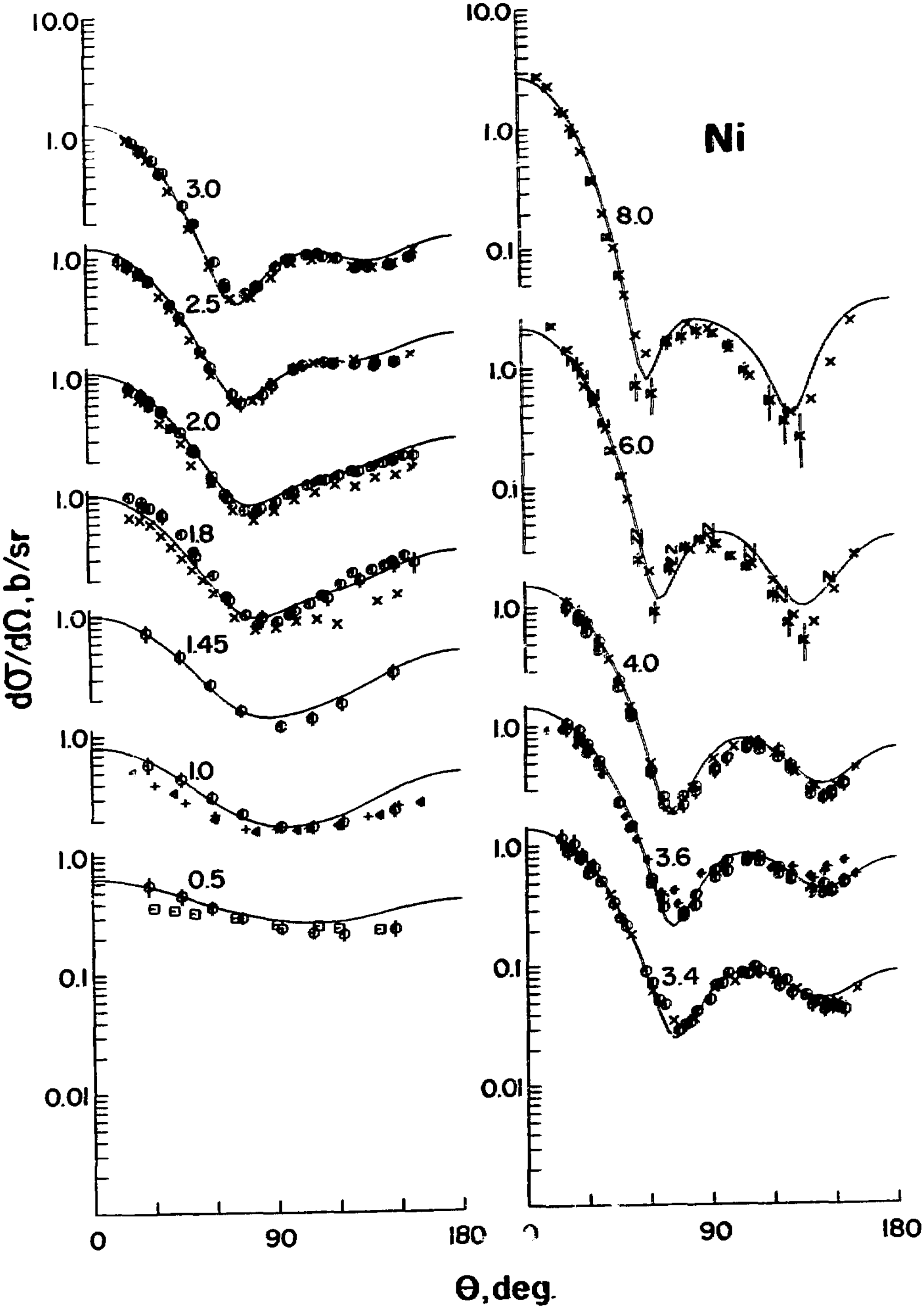
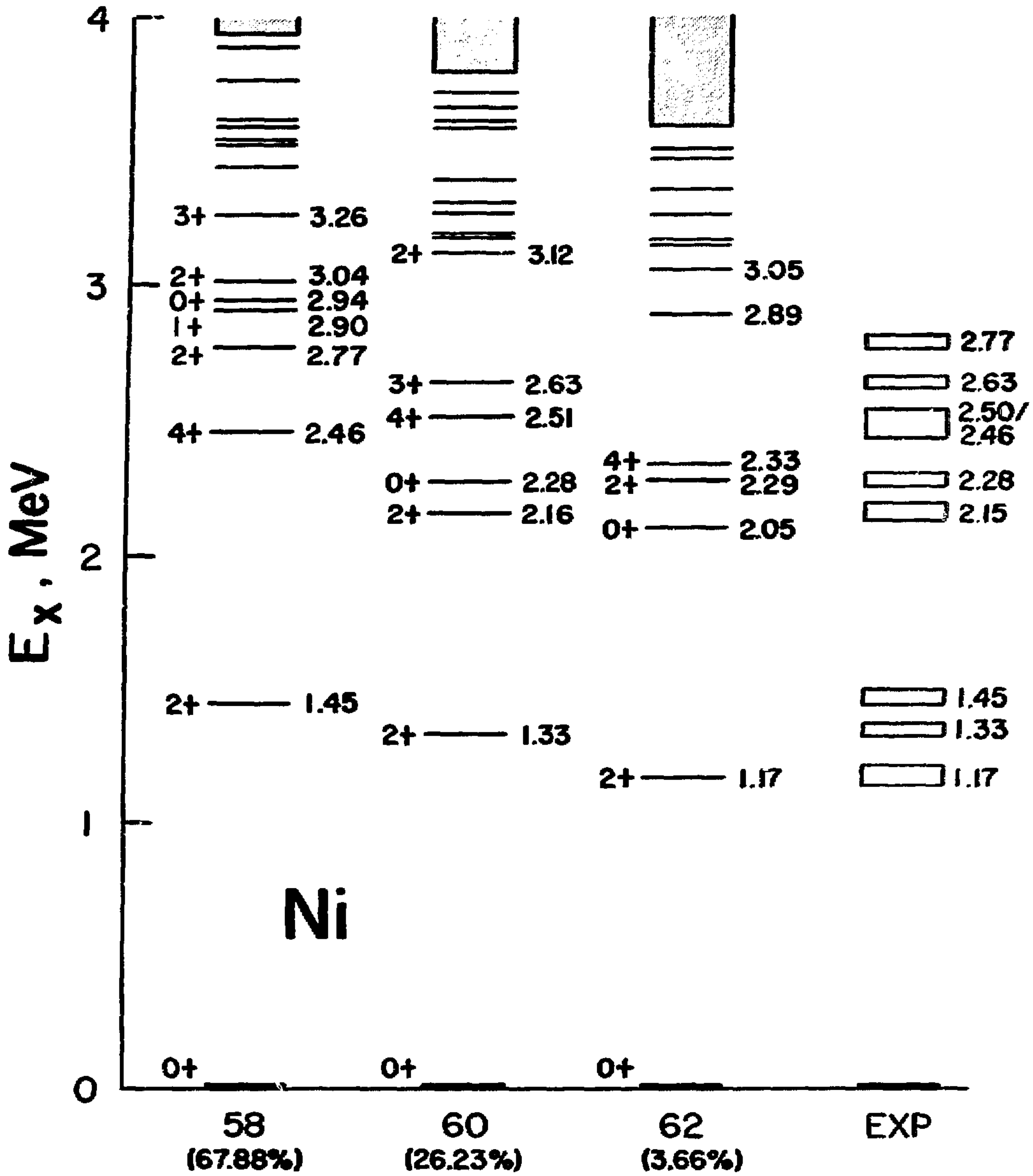

Ni
dσ/dΩ, b/sr
θ, deg.
10.0
1.0
0.1
0.01
3.0
2.5
2.0
1.8
1.45
1.0
0.5
8.0
6.0
4.0
3.6
3.4
0
90
180

Fig. 4



Ex, MeV
4
3
2
1
0
3+ 3.26
2+ 3.04
0+ 2.94
1+ 2.90
2+ 2.77
4+ 2.46
2+ 1.45
0+
2+ 3.12
3+ 2.63
4+ 2.51
0+ 2.28
2+ 2.16
2+ 1.33
0+
3.05
2.89
4+ 2.33
2+ 2.29
0+ 2.05
2+ 1.17
0+
2.77
2.63
2.50/
2.46
2.28
2.15
1.45
1.33
1.17
Ni
58
(67.88%)
60
(26.23%)
62
(3.66%)
EXP

Fig. 5

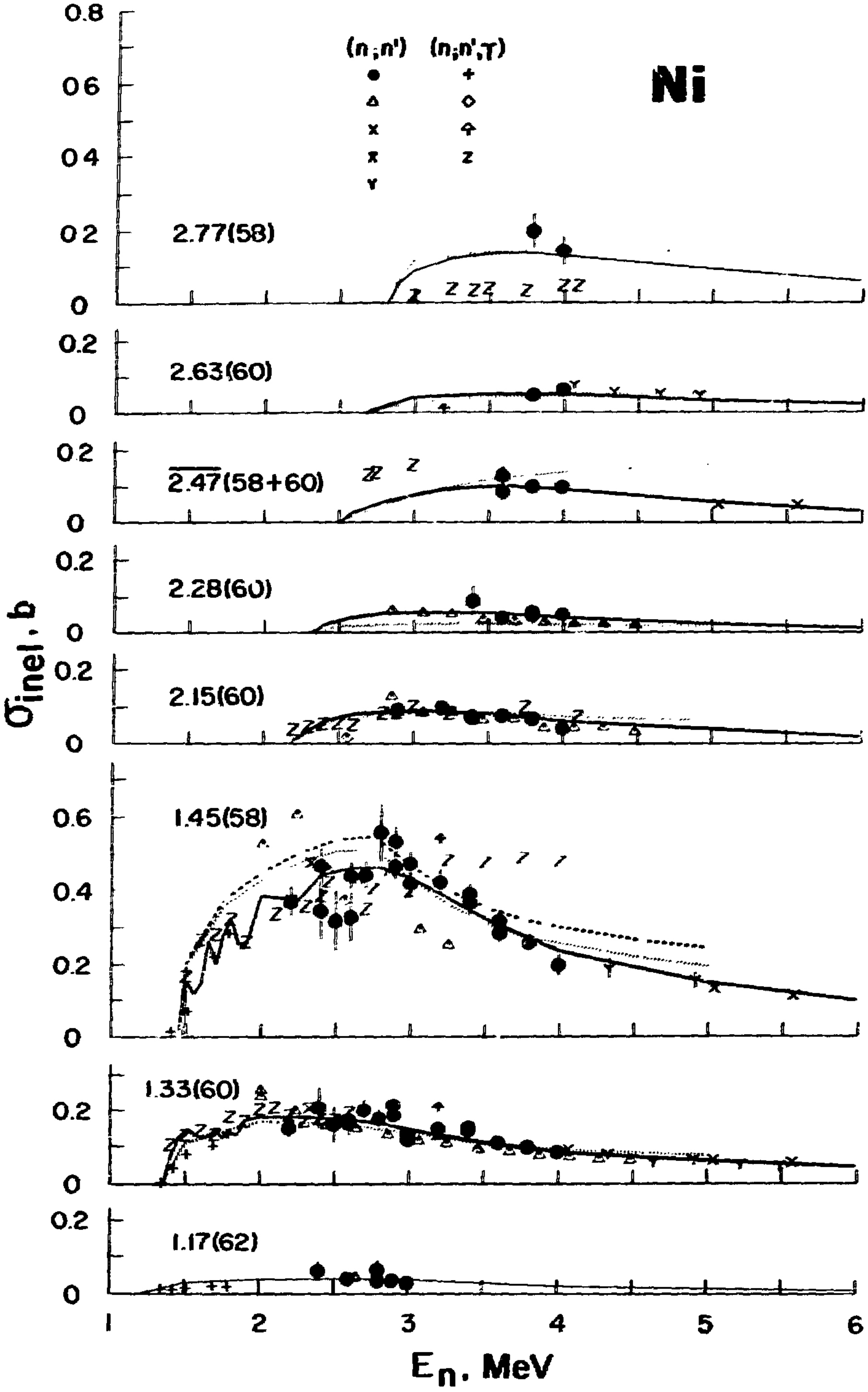

Ni
(n;n')
(n;n',γ)
2.77(58)
2.63(60)
$\overline{2.47}$(58+60)
2.28(60)
2.15(60)
1.45(58)
1.33(60)
1.17(62)
σ_{inel}, b
E_n, MeV
0
0.2
0.4
0.6
0.8
1
2
3
4
5
6

Fig. 6

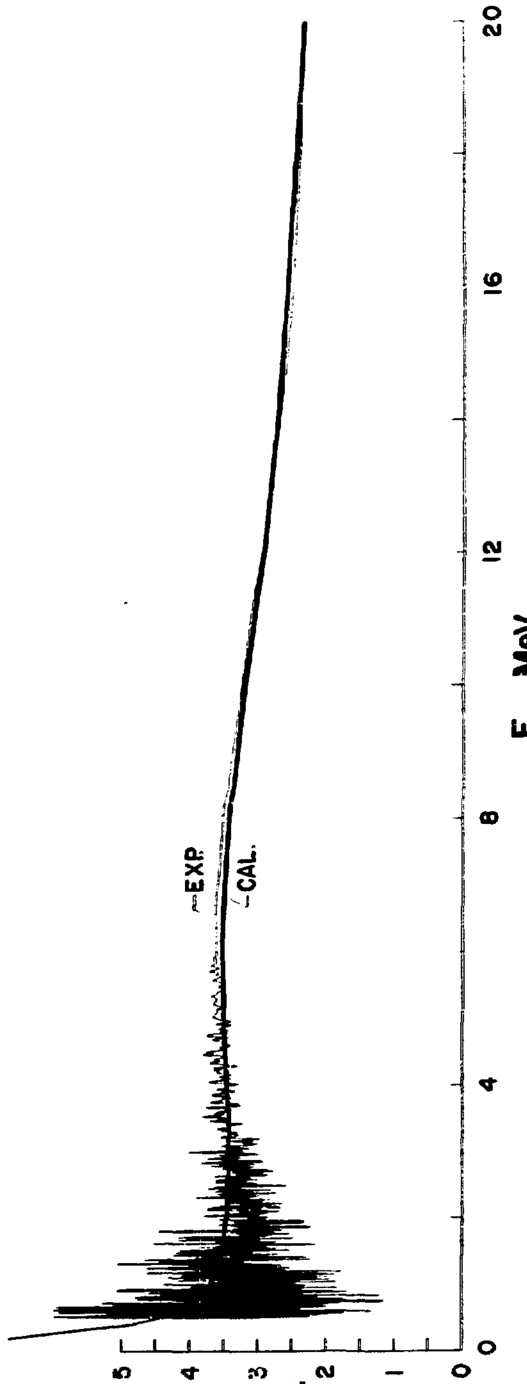
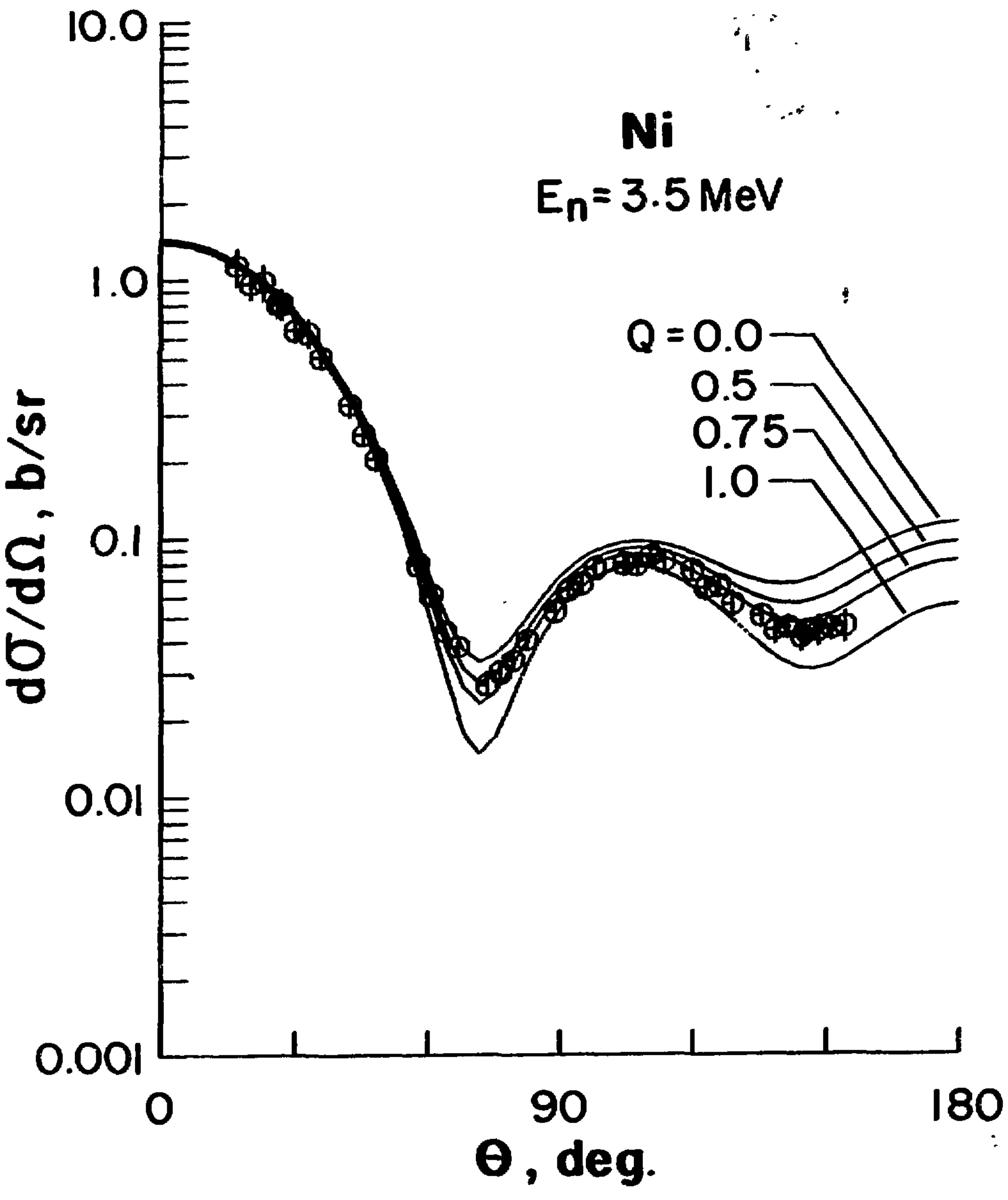


Fig. 7


Ni
$E_n = 3.5$ MeV
Q = 0.0
0.5
0.75
1.0
10.0
1.0
0.1
0.01
0.001
$d\sigma/d\Omega$, b/sr
0
90
180
Θ, deg.

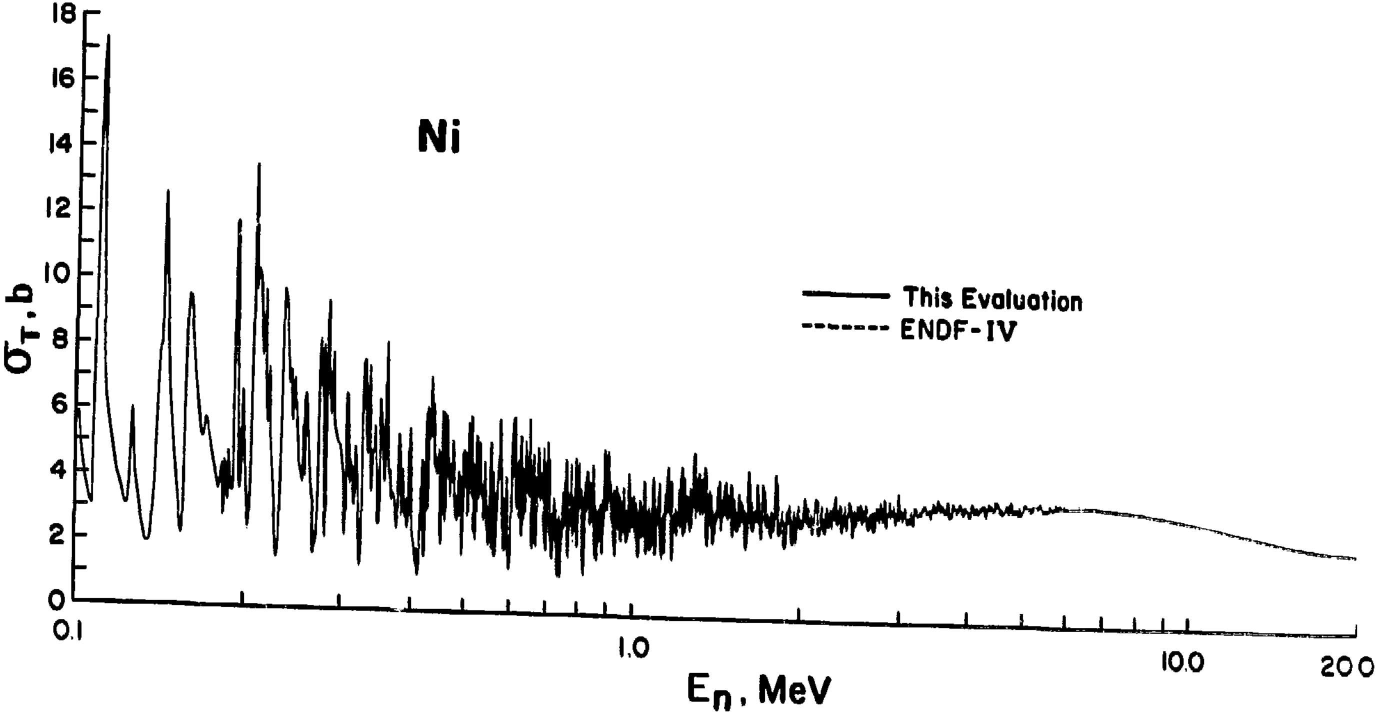

Ni
This Evaluation
ENDF-IV
σ_T, b
E_n, MeV
0
2
4
6
8
10
12
14
16
18
0.1
1.0
10.0
20.0

Fig. 8

Fig. 9

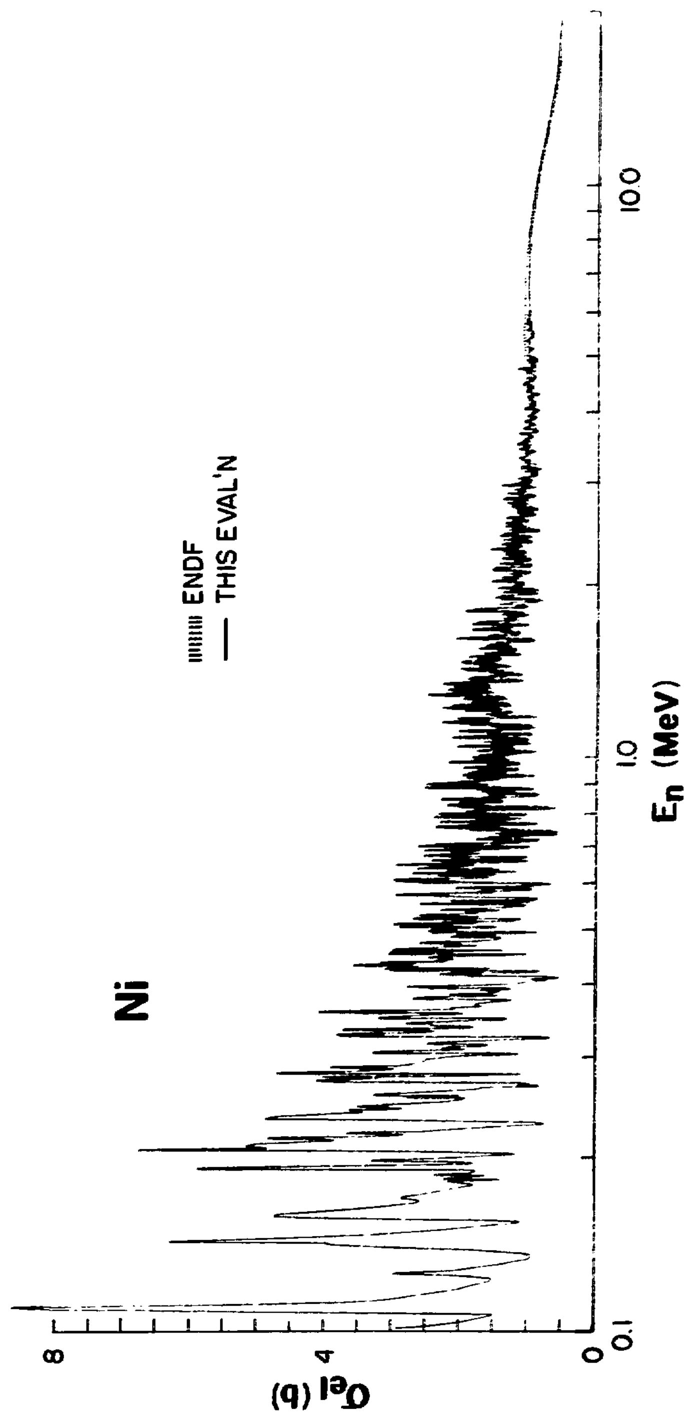


Fig. 10

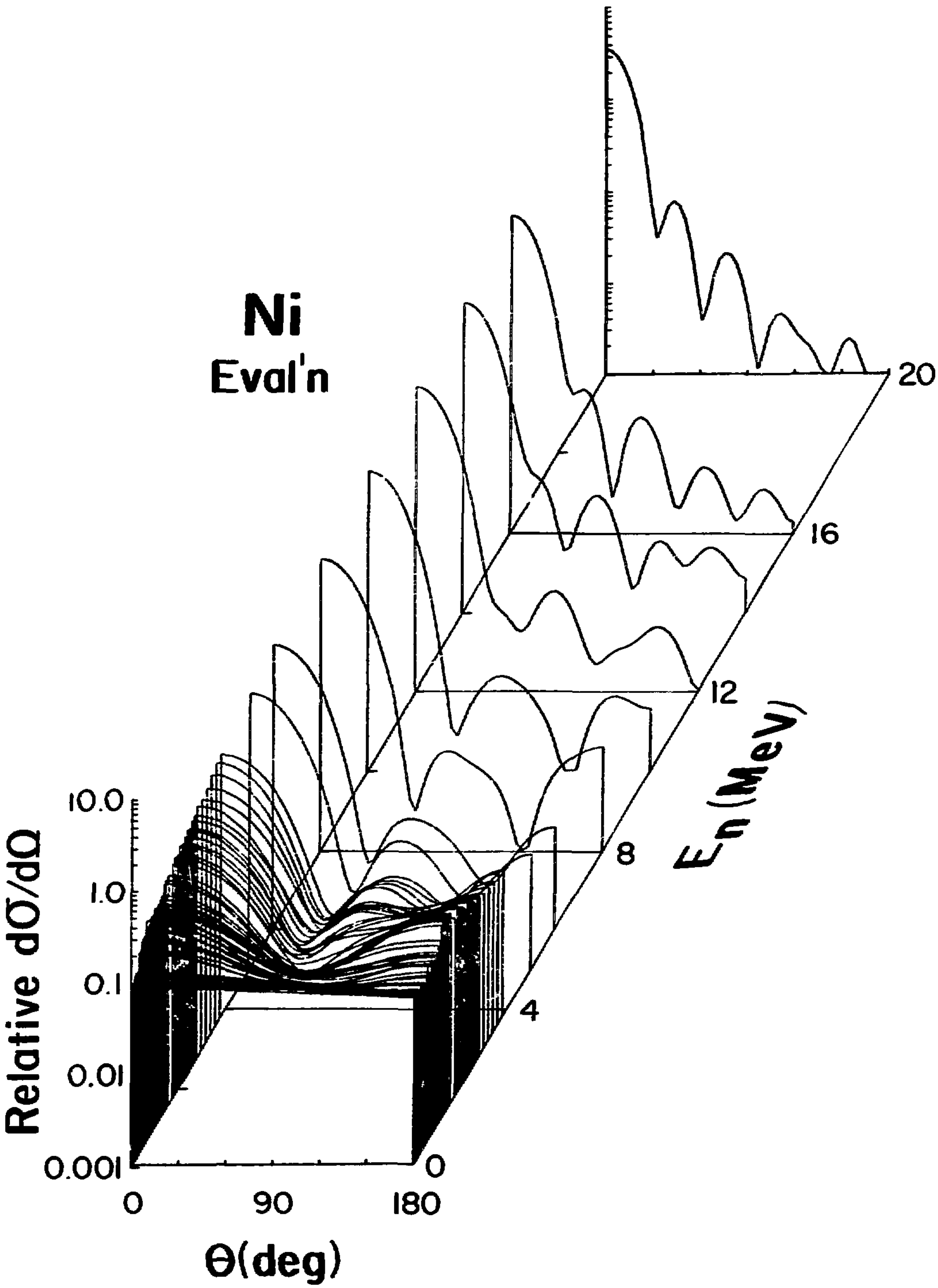
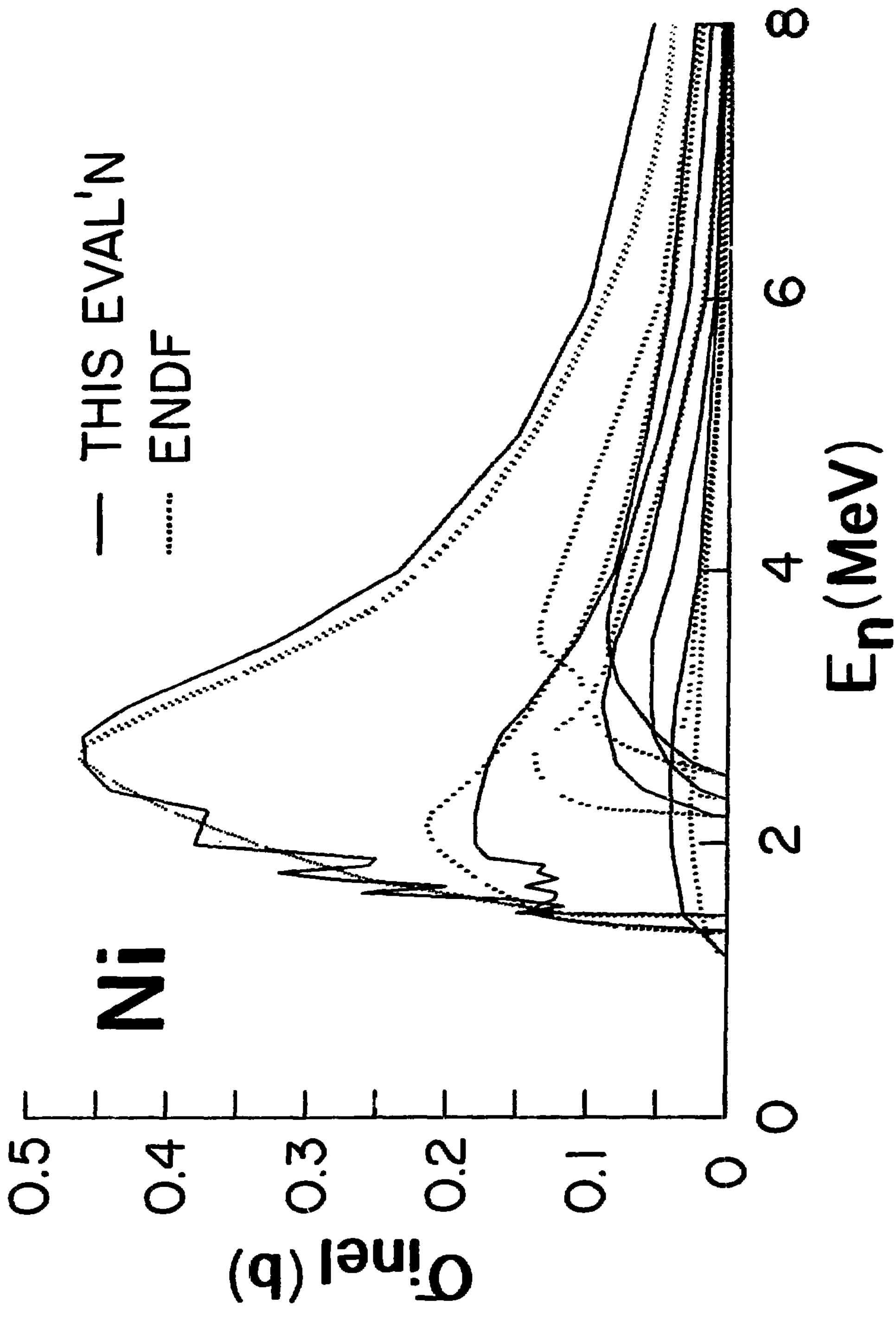
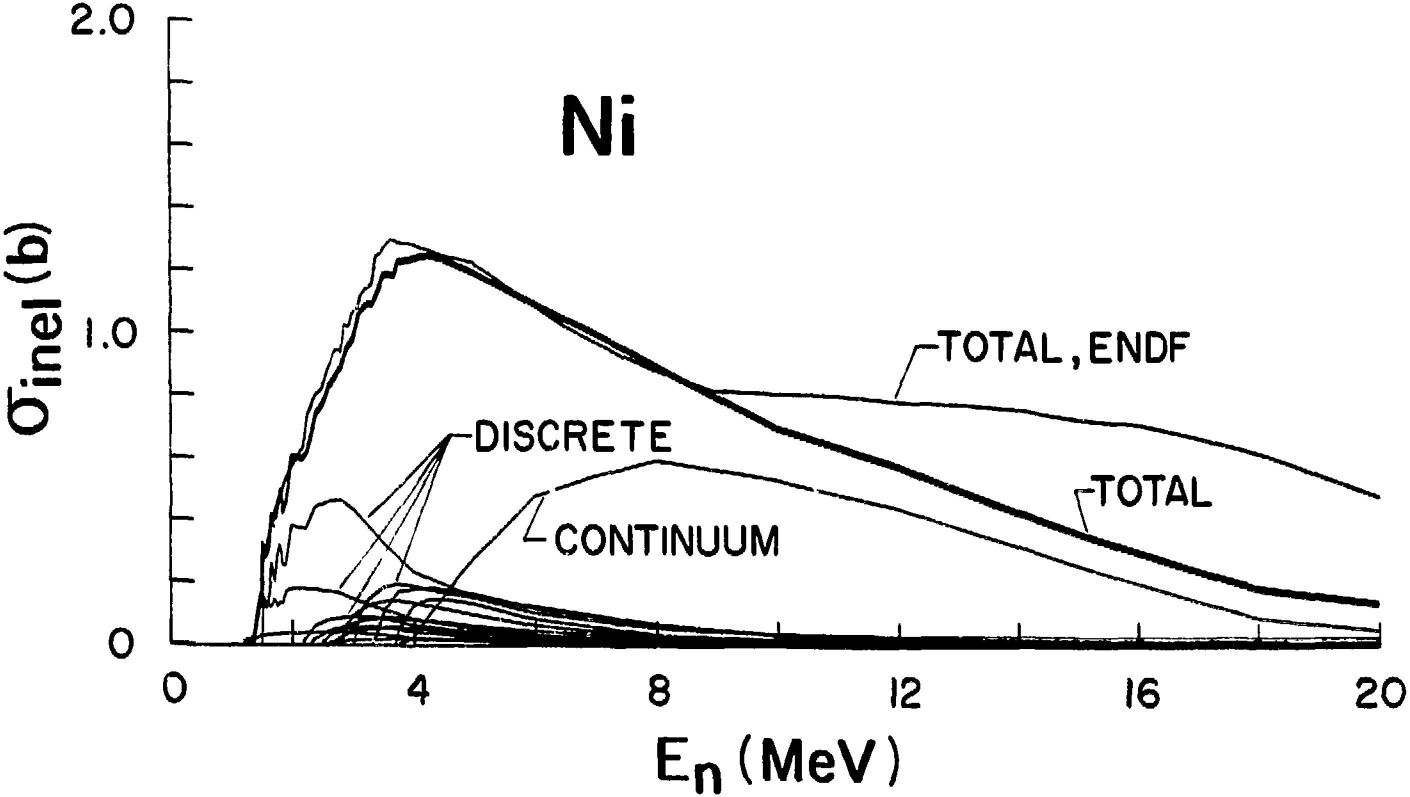

Ni
Eval'n
10.0
1.0
0.1
0.01
0.001
Relative dσ/dΩ
0
90
180
Θ(deg)
0
4
8
12
16
20
E_n(MeV)

Fig. 11





2.0
1.0
0
Ni
TOTAL, ENDF
DISCRETE
CONTINUUM
TOTAL
0
4
8
12
16
20
σ_{inel} (b)
E_n (MeV)

Fig. 17

Fig. 13

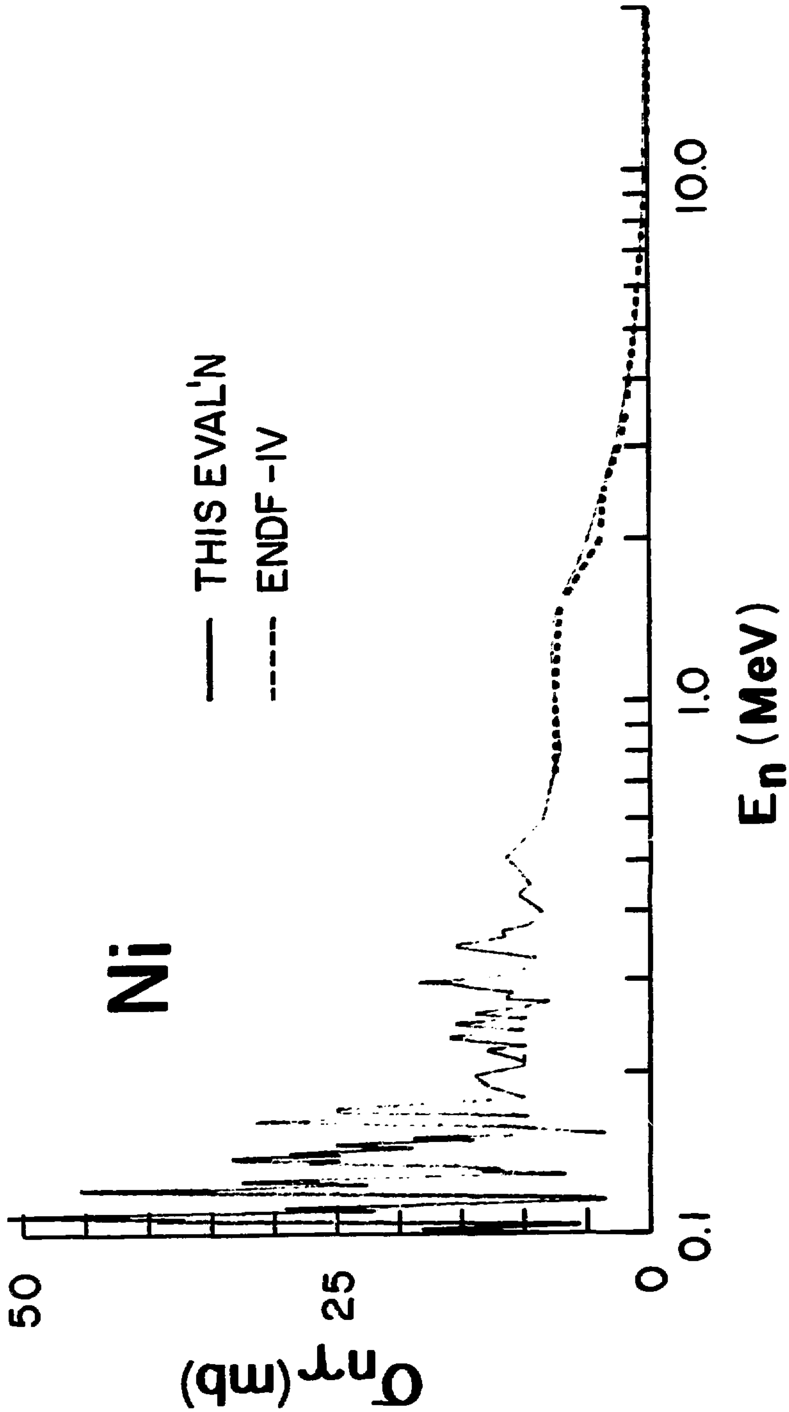


Fig. 14

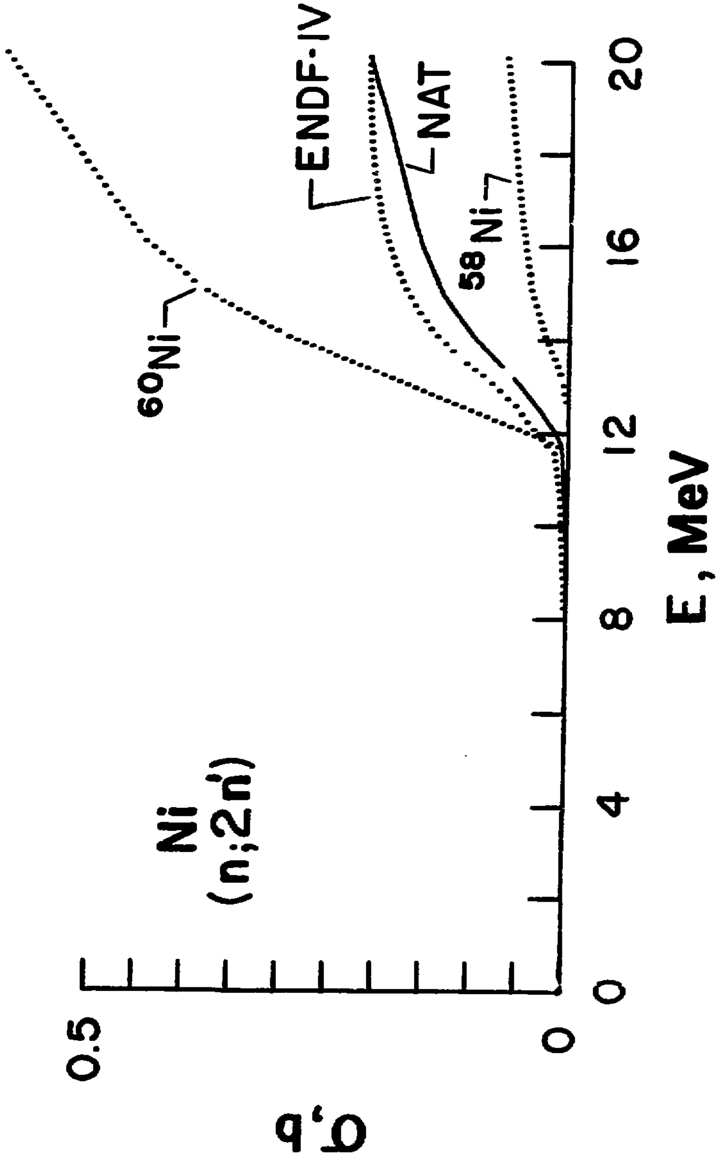


Fig. 15

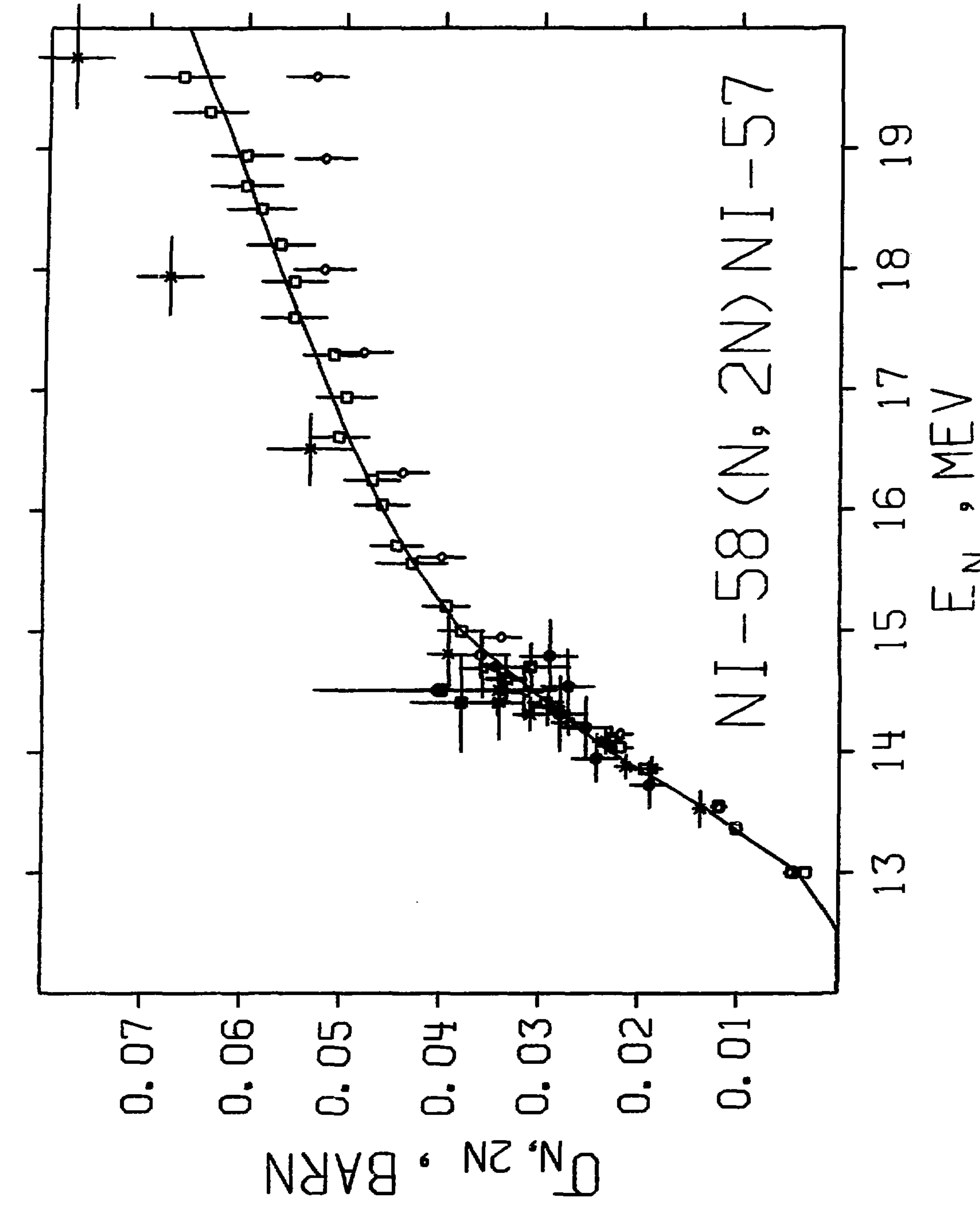

NI-58 (N, 2N) NI-57
E_N, MEV
$\sigma_{N,2N}$, BARN
13
14
15
16
17
18
19
0.01
0.02
0.03
0.04
0.05
0.06
0.07

Fig. 16

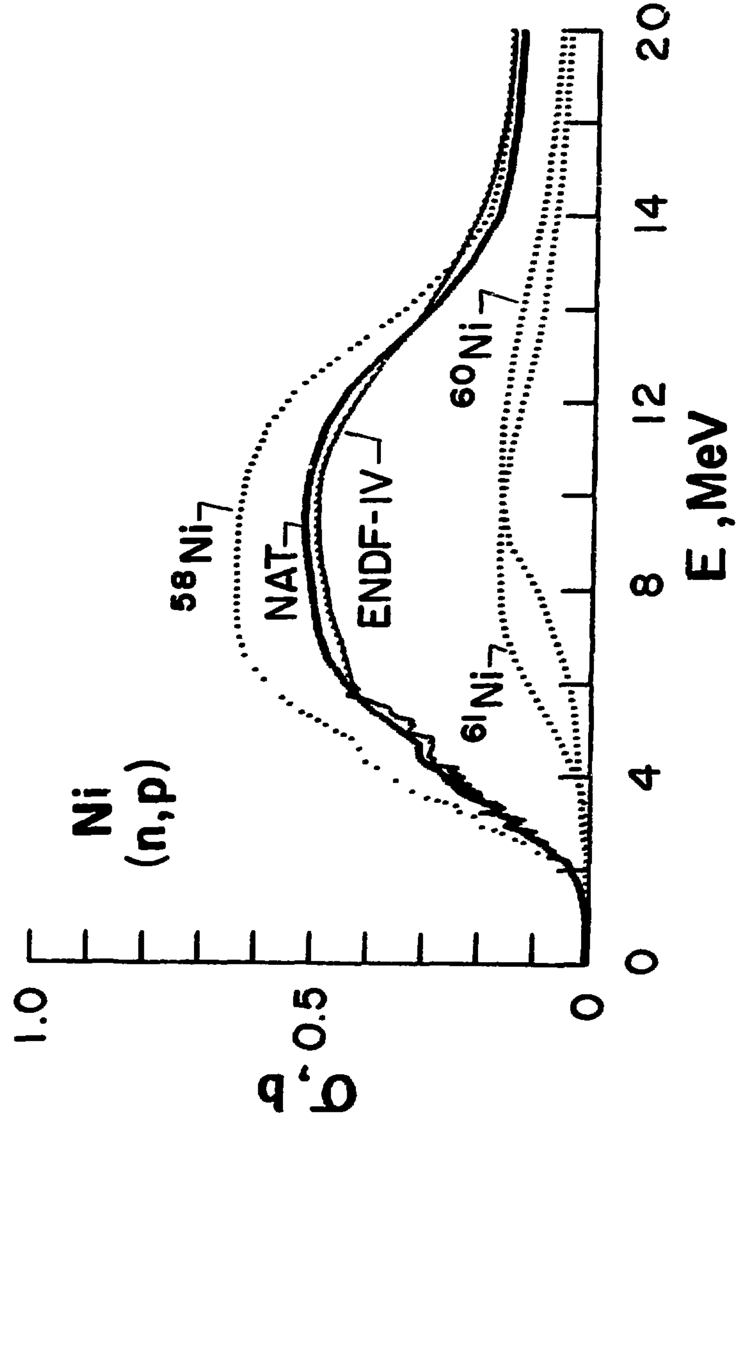


Fig. 17

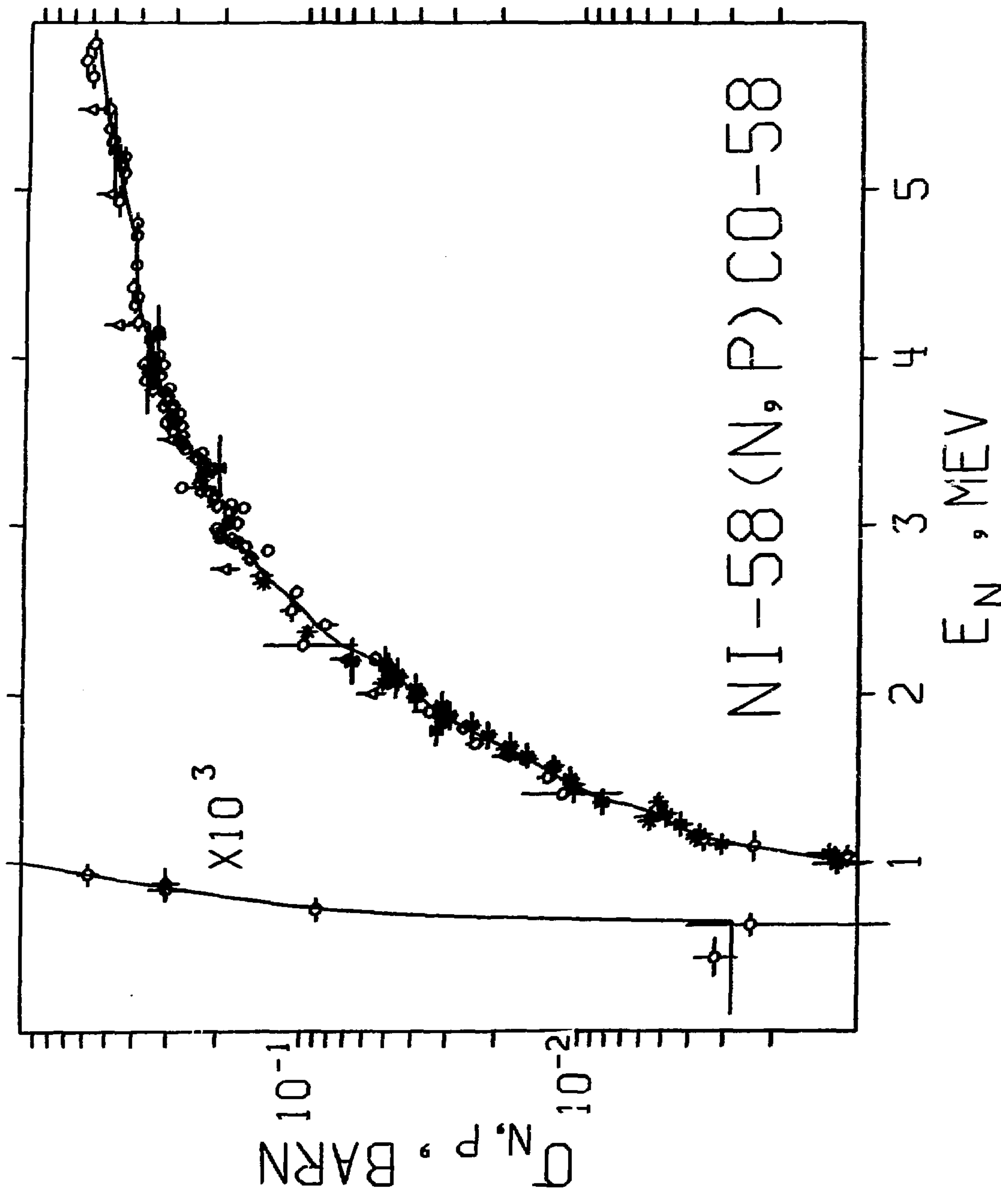


Fig. 18

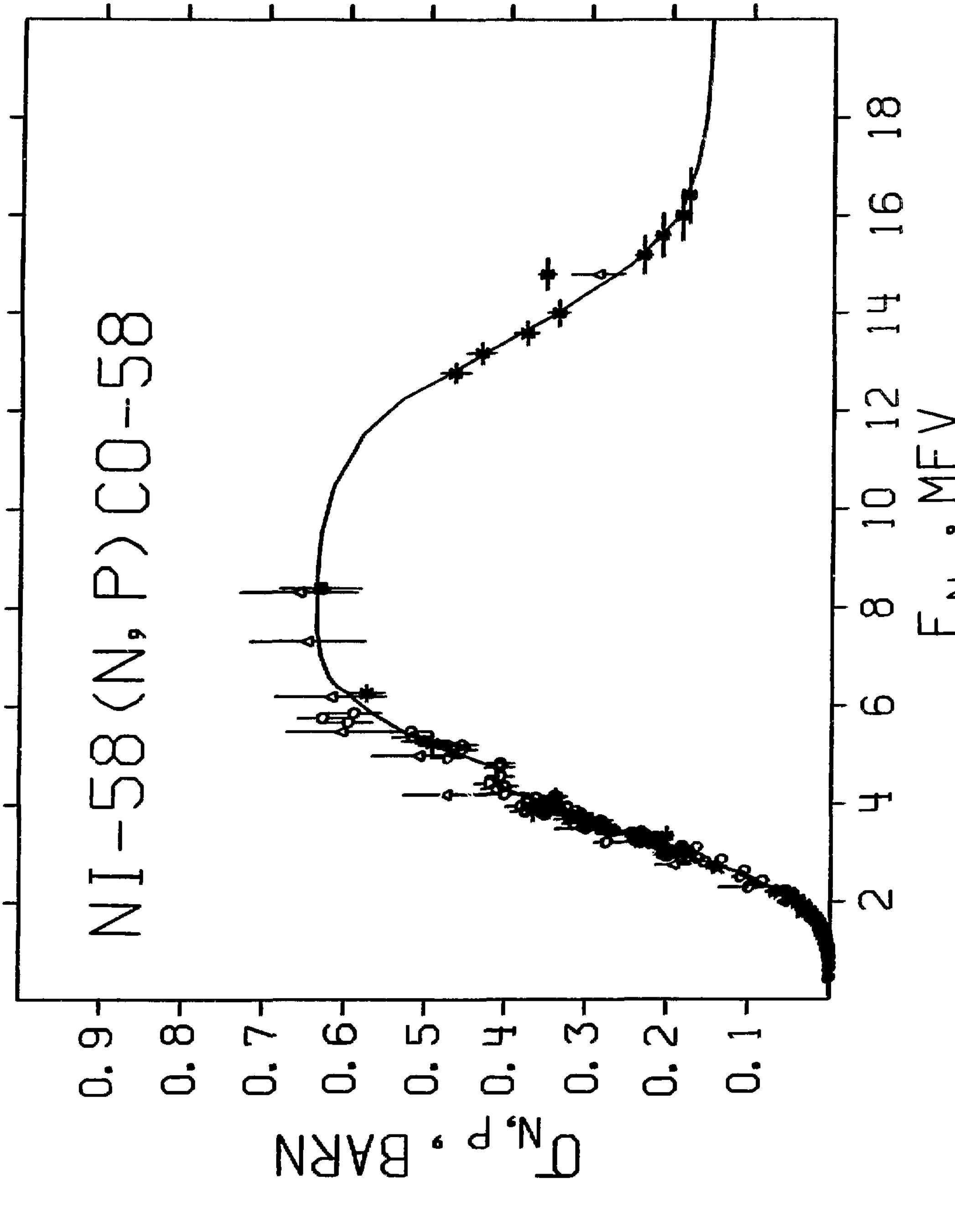

NI-58(N,P)CO-58
E_N, MEV
$\sigma_{N,P}$, BARN
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
2
4
6
8
10
12
14
16
18

Fig. 19

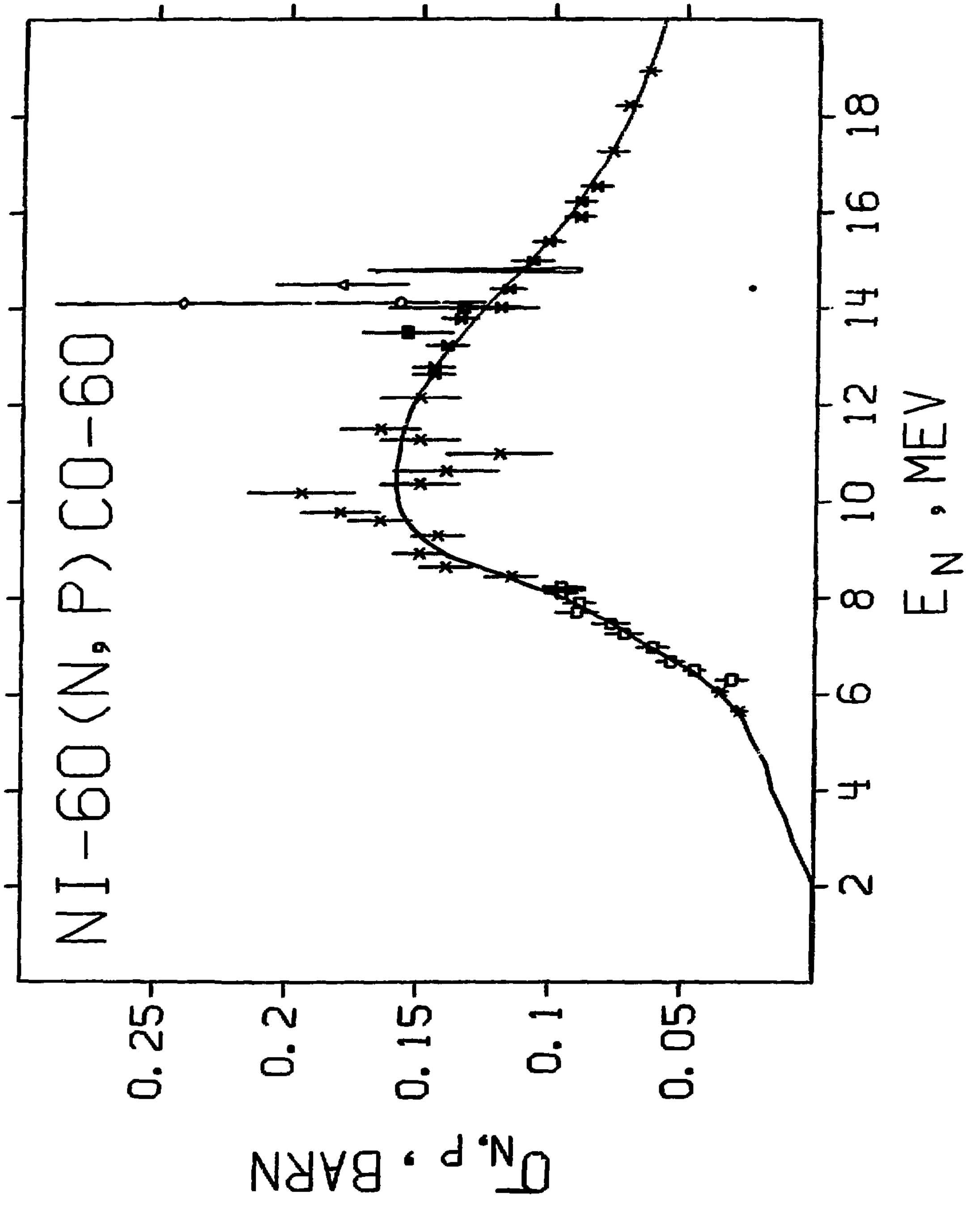


Fig. 20

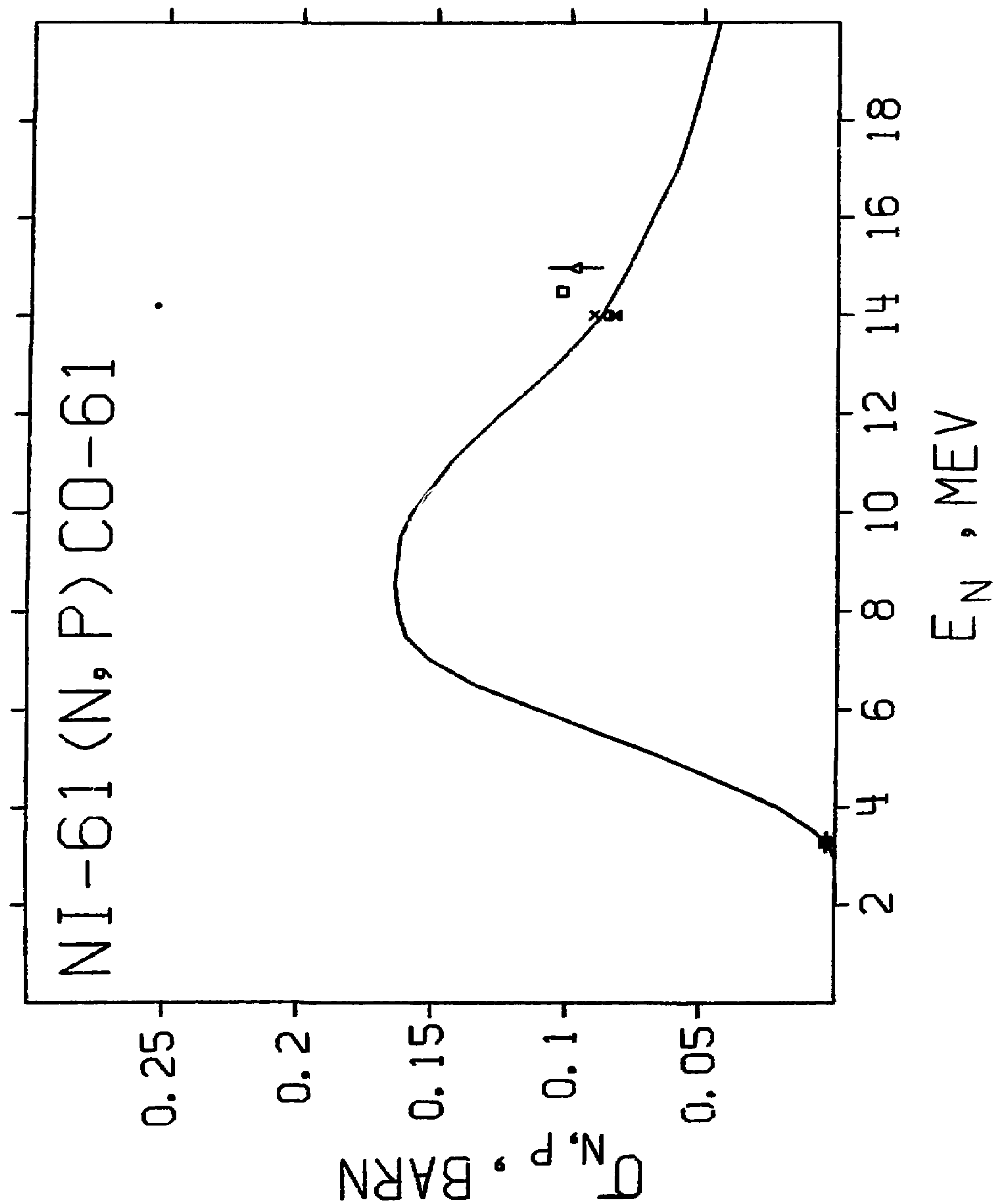
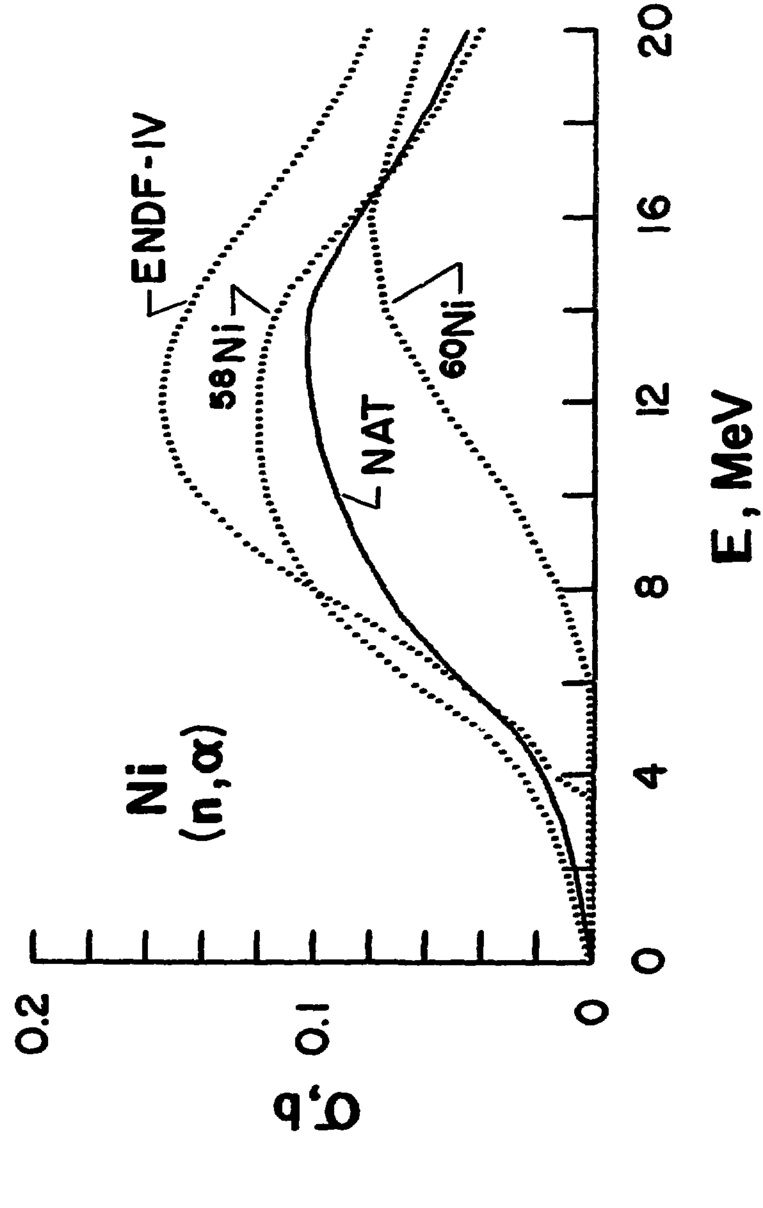
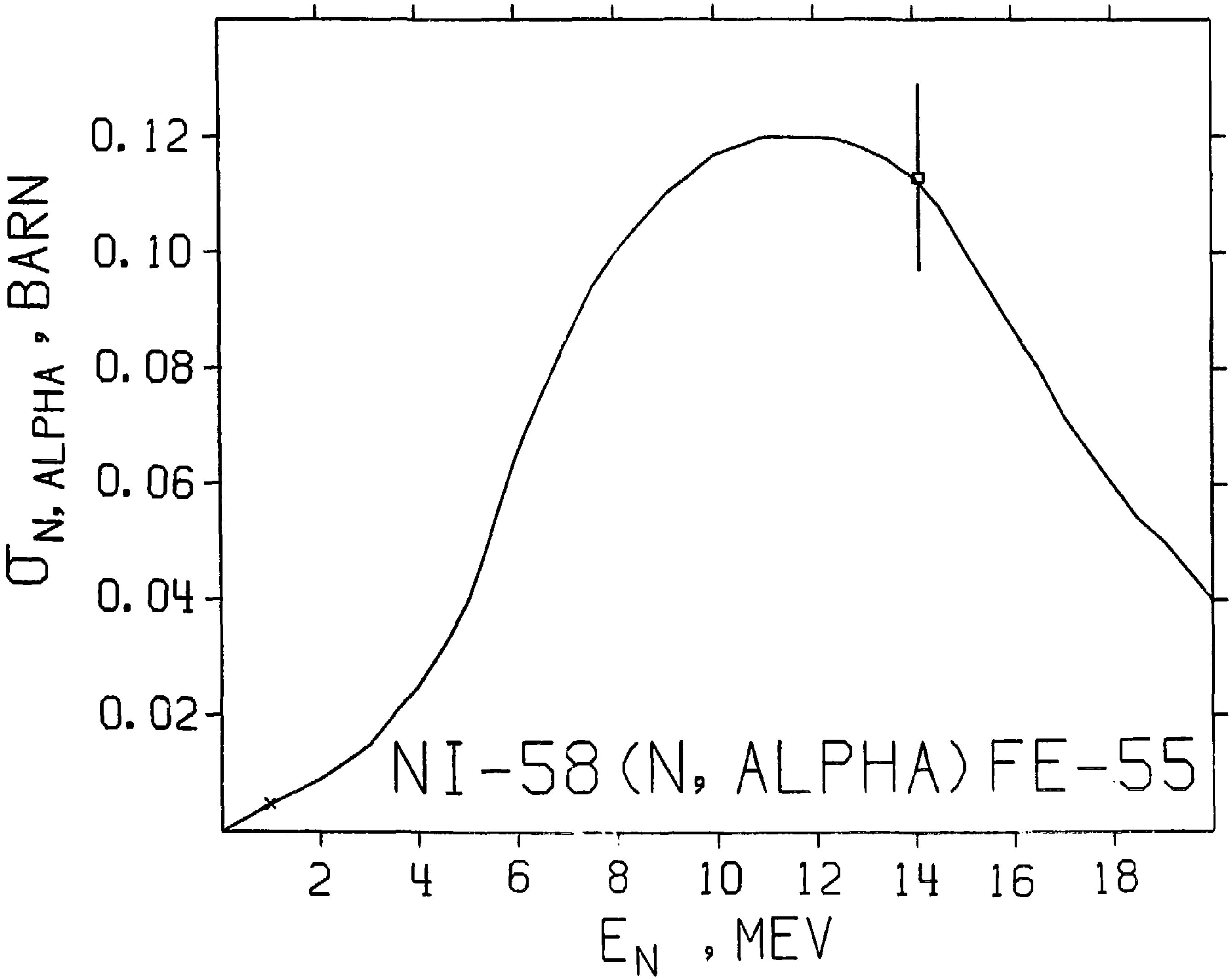


Fig. 21





NI-58(N, ALPHA)FE-55
σ N, ALPHA , BARN
E N , MEV
0.02
0.04
0.06
0.08
0.10
0.12
2
4
6
8
10
12
14
16
18

Fig. 22

Fig. 23

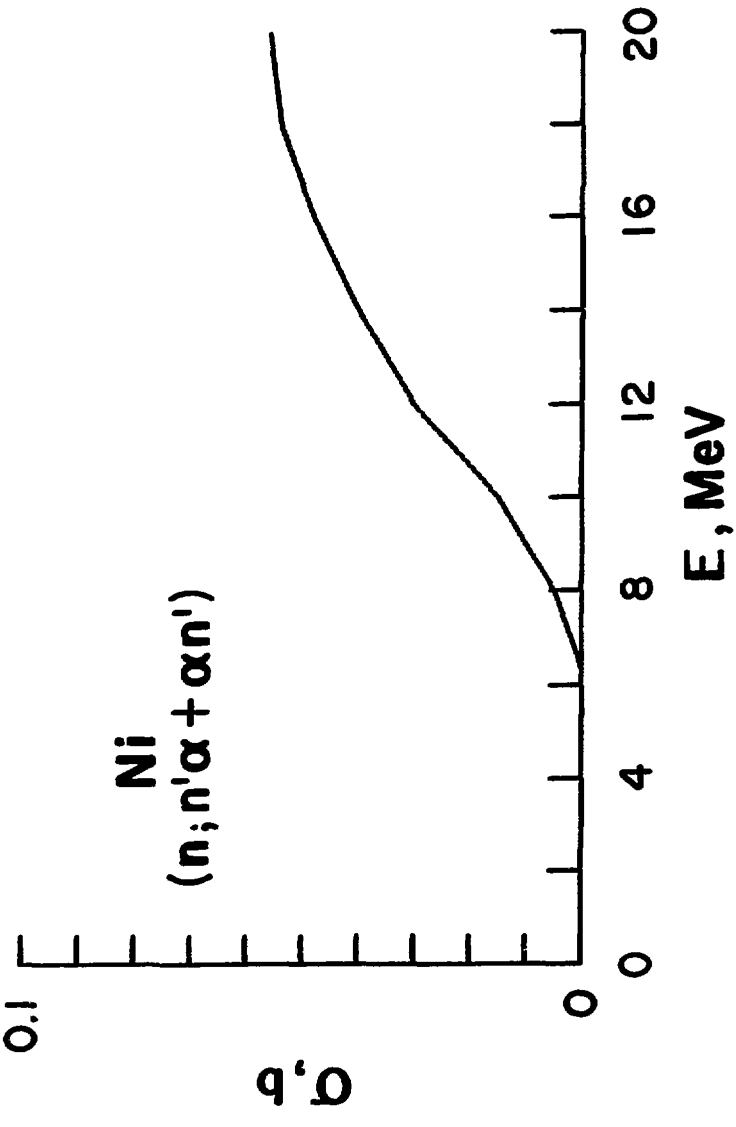


Fig. 24

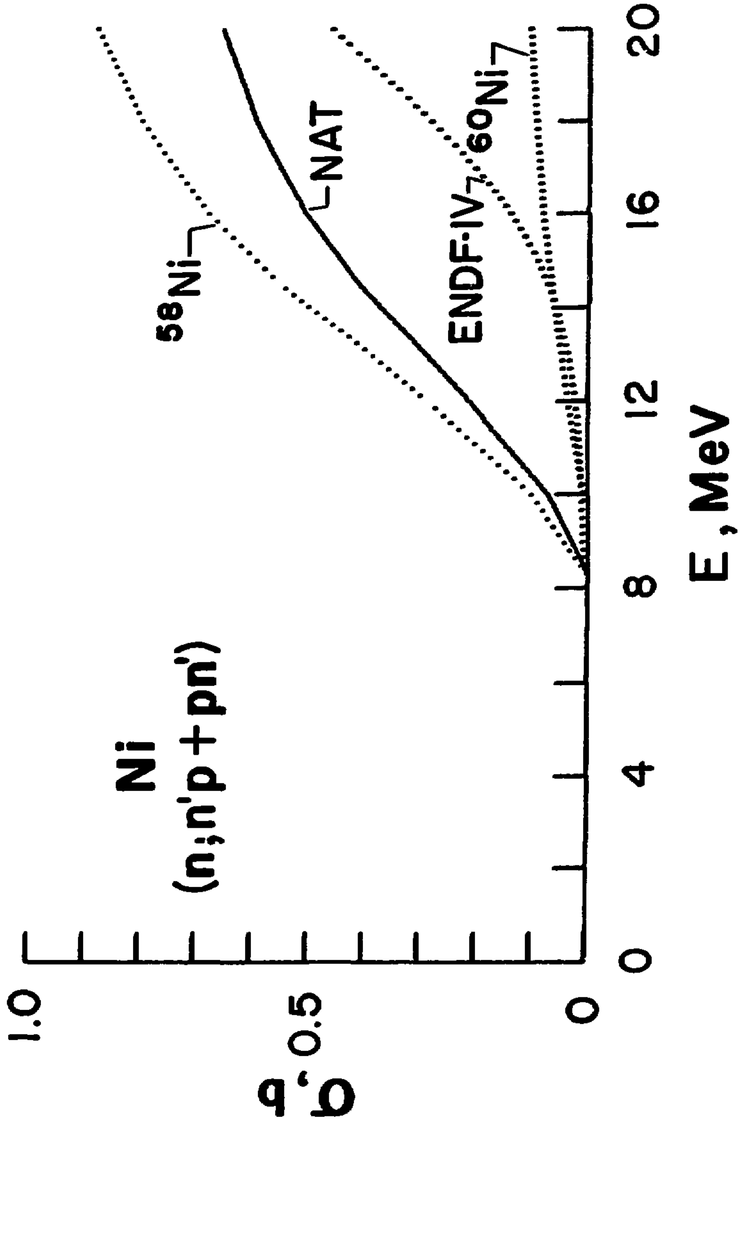


Fig. 25

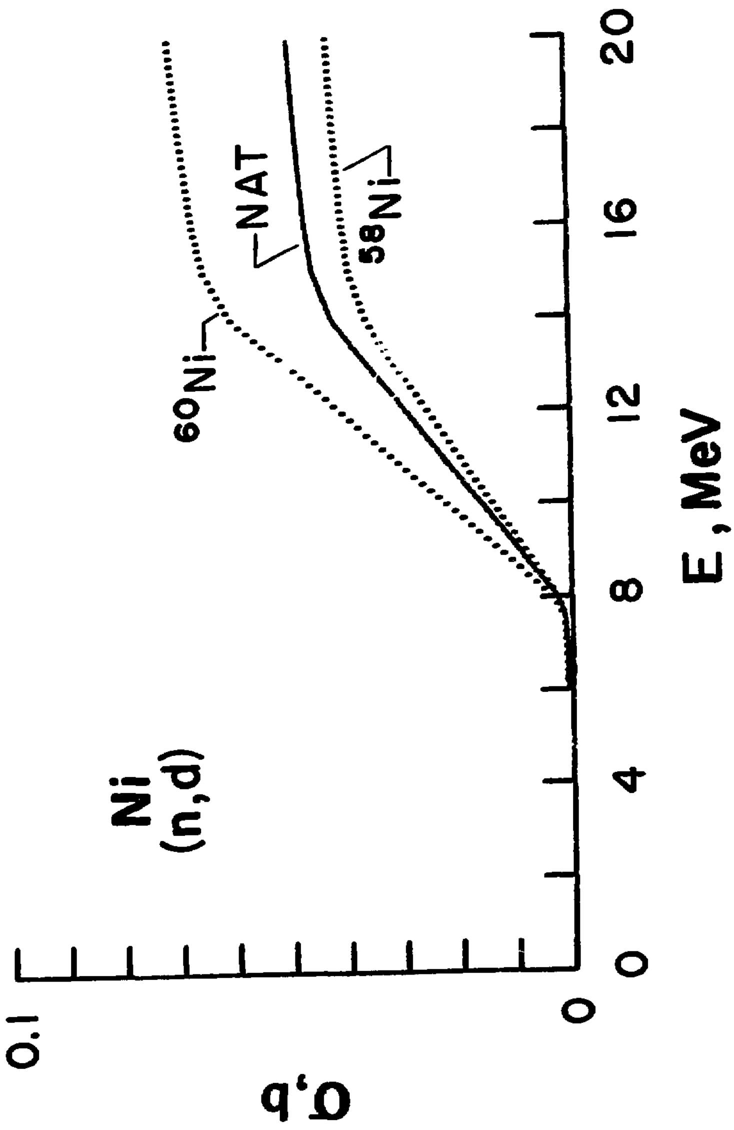
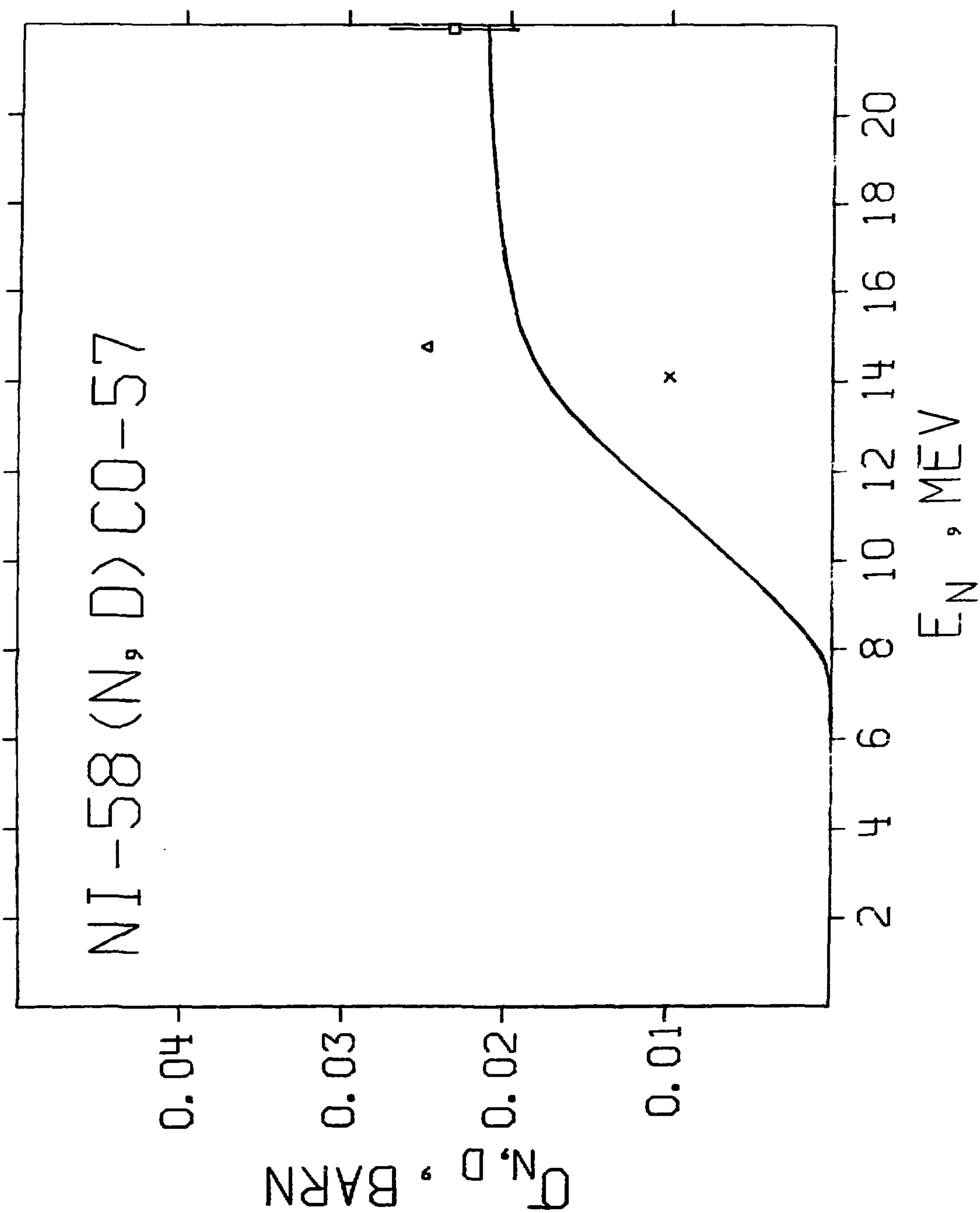


Fig. 26



NI-58 (N, D) CO-57
E_N, MEV
$\sigma_{N,D}$, BARN
2
4
6
8
10
12
14
16
18
20
0.01
0.02
0.03
0.04

Fig. 27

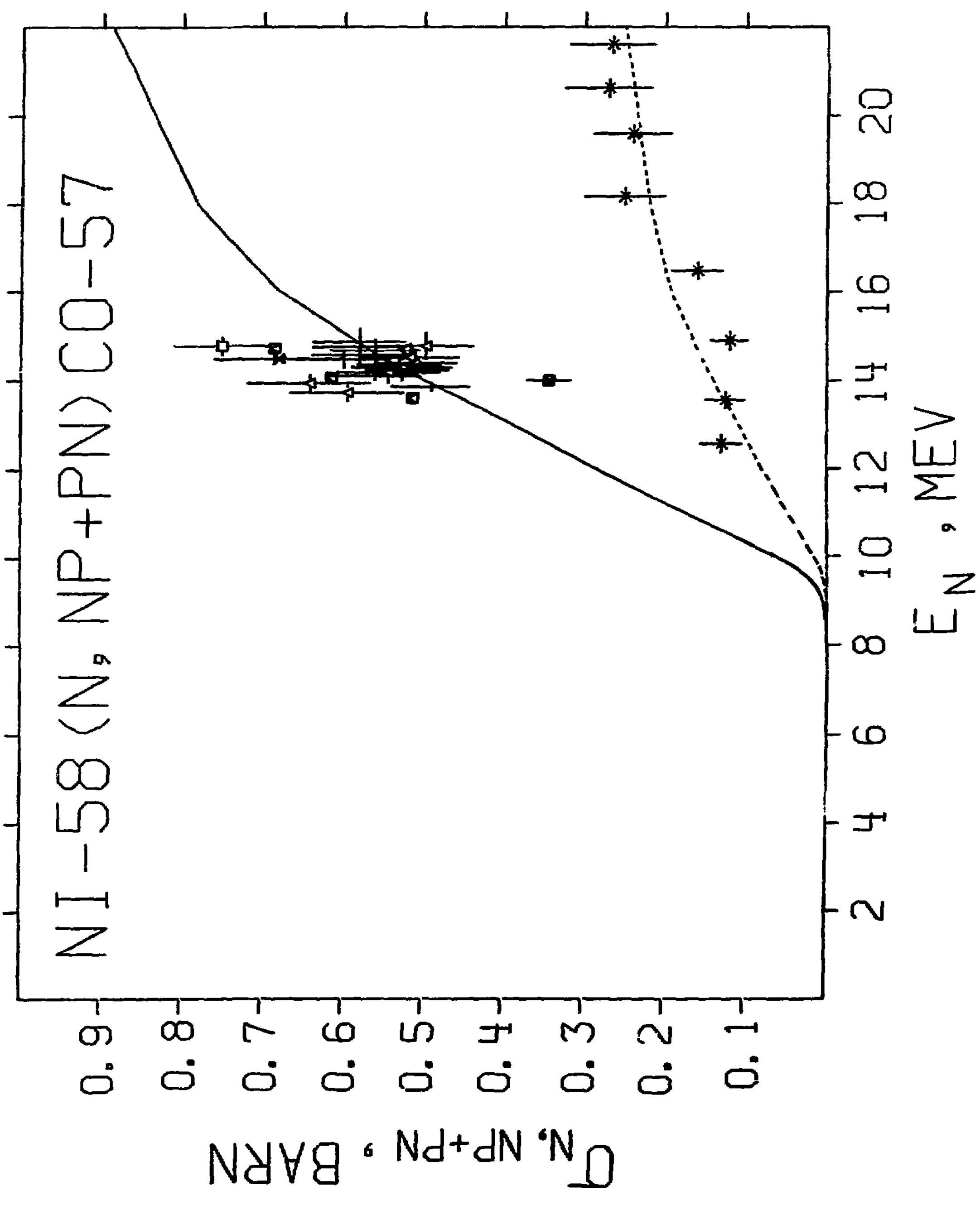
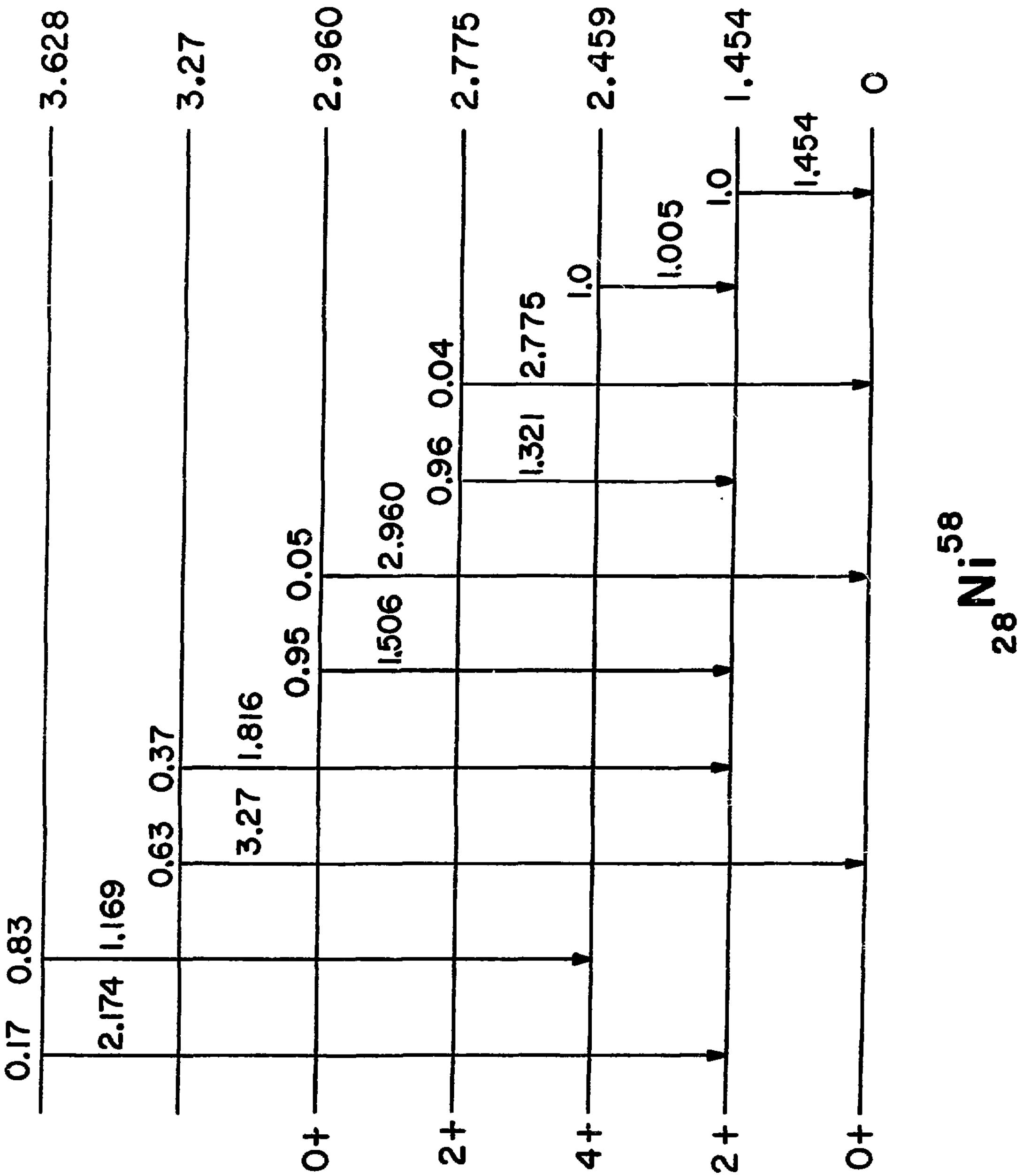
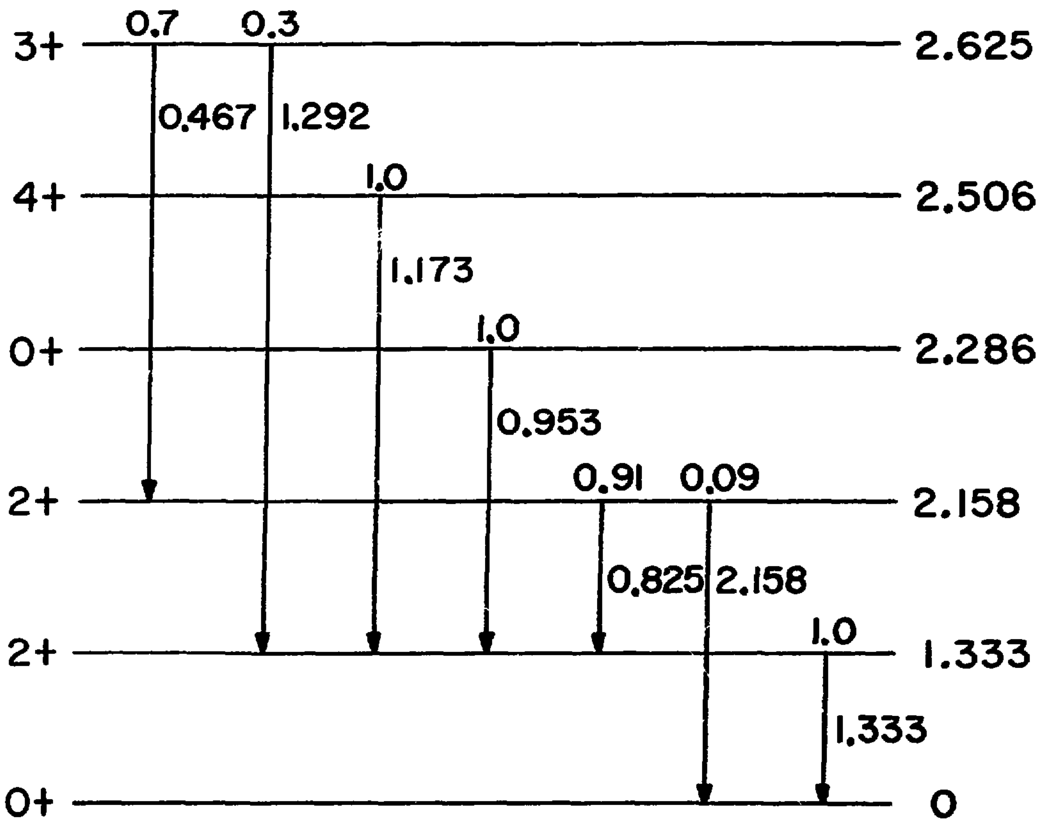


Fig. 28



3.628
3.27
2.960
2.775
2.459
1.454
0
0+
2+
4+
2+
0+
0.17
2.174
0.83
1.169
0.63
3.27
0.37
1.816
0.95
1.506
0.05
2.960
0.96
1.321
0.04
2.775
1.0
1.005
1.0
1.454
28Ni58

Fig. 29



$_{28}Ni^{60}$