ATOMIC DATA AND NUCLEAR DATA TABLES 33, 405–446 (1985)

THE LAMB SHIFT IN HYDROGEN-LIKE ATOMS, $1 \leqslant Z \leqslant 110$

W. R. JOHNSON

Department of Physics, College of Science
University of Notre Dame
Notre Dame, Indiana 46556

Institut für Theoretische Physik
Johann Wolfgang Goethe-Universität
D-6000 Frankfurt am Main 11, West Germany

and

GERHARD SOFF

Gesellschaft für Schwerionenforschung (GSI)
Planckstrasse 1, Postfach 110 541
D-6100 Darmstadt, West Germany

Theoretical energy levels and energy-level separations for $n = 1$ and $n = 2$ states of hydrogen-like atoms with nuclear charge numbers in the range $1 \leqslant Z \leqslant 110$ are tabulated. Quantum electrodynamical corrections of first and second order in the fine-structure constant α are included, together with finite nuclear size corrections, reduced mass corrections, and recoil corrections.

0092-640X/85 $3.00

CONTENTS

INTRODUCTION

In this paper we tabulate theoretical energy levels and energy-level separations among $n = 1$ and $n = 2$ states of hydrogen-like atoms with nuclear charges in the range $1 \leq Z \leq 110$. A detailed breakdown of the quantum electrodynamical (QED) corrections to the binding energies of $1s_{1/2}$, $2s_{1/2}$, $2p_{1/2}$, and $2p_{3/2}$ states is given for each atom. For atoms in the range $1 \leq Z \leq 40$ the resulting energy levels are in close agreement with those tabulated by P. Mohr;[1,2] indeed, the present tables as well as those of Refs. 1 and 2 are based on nonperturbative numerical calculations of the lowest-order (in α) electron self-energy.[3-7] For values of $Z > 40$ the present energy levels have smaller theoretical uncertainty than those given previously by Erickson.[8]

Measurements of the energy levels of high-Z hydrogen-like ions provide tests of strong-field quantum electrodynamics. Those measurements of the Lamb shift in one-electron ions reviewed by Kugel and Murnick,[9] as well as more recent measurements,[10-21] are in agreement with the present theoretical values. By contrast there still may remain for the lightest atom, hydrogen, a small unresolved discrepancy between the theoretical and experimental values of the $n = 2$ Lamb shift.[22] In light of recently developed techniques for producing hydrogen-like uranium[23] one foresees the possibility of Lamb-shift measurements on the heaviest elements in the near future. Additionally, Lamb-shift calculations for hydrogen-like atoms form the basis for theoretical studies of helium-like atoms.[24]

Contributions to Electron Binding Energies

In Table I we present the energy levels as a sum of three parts:

1. Dirac Coulomb Energy

The eigenvalue of the Dirac equation for an electron moving in the Coulomb field of a point nucleus may be written

$$E_{nk} = -\frac{2Z^2}{N(N+n+\gamma-k)}\,\mathrm{Ry} \qquad (1)$$

for a state with principal quantum number n and angular momentum quantum number $k = j + 1/2$. In Eq. (1), $\gamma = \sqrt{k^2 - (Z\alpha)^2}$ and $N = \sqrt{n^2 - 2(n-k)(k-\gamma)}$. In our calculations we use the values[25,26]

$$\alpha = 1/137.035965(12)$$

for the fine-structure constant, and

$$\mathrm{Ry} = 109737.31521(11)\ \mathrm{cm}^{-1}$$

for the Rydberg constant.

2. Reduced Mass Correction

The reduced mass correction, which also includes the relativistic reduced mass correction,[27,28] is written

$$\Delta_{\mathrm{RM}}E_{nk} = -\frac{m}{m+M}\left(1 - \frac{(Z\alpha)^2}{4n^2}\right)E_{nk}, \qquad (2)$$

where m is the electron mass and M is the nuclear mass. The values of M used in the tabulation are listed in the subheadings in Table I. For the electron mass in atomic mass units we use[29]

$$m = 0.00054858026(21)\ \text{a.m.u.}$$

3. Lamb Shift

The Lamb shift includes radiative corrections, corrections due to finite nuclear size, relativistic recoil corrections, and reduced mass corrections of the radiative corrections. We list the individual contributions to the Lamb shift in Table II. These contributions are expressed in terms of a dimensionless, slowly varying function $F(Z\alpha)$ defined in terms of the level shift ΔE by the relation

$$\Delta_{LS}E = \frac{\alpha}{\pi}\frac{(Z\alpha)^4}{n^3}F(Z\alpha)\,mc^2. \tag{3}$$

We describe below how each contribution to $F(Z\alpha)$ which is listed in Table II was determined.

Self-energy. The largest contribution to the Lamb shift is the electron self-energy. For an electron moving in the Coulomb field of a point nucleus Mohr[3,4] calculated the self-energy for the $n = 1$ and $n = 2$ states for nuclear charges $Z = 10, 20, \ldots, 110$. These numerical calculations are in slight disagreement with the corresponding analytical calculations carried out in perturbation theory by Erickson and Yennie[30] and by Erickson,[31] but they have been confirmed by the studies of Sapirstein.[32]

In the present compilation we employ the numerical values of Mohr for the Coulomb field self-energy together with his estimates of the numerical uncertainty in these values. To interpolate Mohr's numerical values we represent $F(Z\alpha)$ in terms of an auxiliary function[30] $G(Z\alpha)$ defined by removing the "confirmed" analytical terms from the numerical values, viz:

$$F(Z\alpha) = (4/3)\{[\ln(Z\alpha)^{-2} + 11/24]\delta_{l0} + L_{nl} + (3/8)C_{jl}/(2l+1) + Z\alpha C_5 + (Z\alpha)^2[C_{62} \times \ln^2(Z\alpha)^{-2} + C_{61}\ln(Z\alpha)^{-2}] + (Z\alpha)^2 G(Z\alpha)\}. \tag{4}$$

The term L_{nl} on the first line of Eq. (4) is the Bethe logarithm, which has the value[30]

$$L_{nl} = -2.984128556 \quad \text{for a } 1s \text{ state } (l = 0),$$
$$= -2.811768893 \quad \text{for a } 2s \text{ state } (l = 0),$$
$$= 0.030016709 \quad \text{for a } 2p \text{ state } (l = 1).$$

The term C_{jl} is a coefficient of the anomalous moment contribution to the Lamb shift. It is given by

$$C_{jl} = 1/(l+1) \quad \text{for} \quad j = l + 1/2,$$
$$= -1/l \quad \text{for} \quad j = l - 1/2.$$

The terms C_5, C_{61}, and C_{62} are "confirmed" structure corrections which have the values[30]

$$C_5 = 3\pi(1 + 11/128 - (1/2)\ln 2)\delta_{l0} \approx 6.968340681\ \delta_{l0},$$
$$C_{61} = 7\ln 2 - 63/80 \quad \text{for } 1s \text{ states},$$
$$= 4\ln 2 + 67/40 \quad \text{for } 2s \text{ states},$$
$$= 103/240 \quad \text{for } 2p_{1/2} \text{ states},$$
$$= 29/120 \quad \text{for } 2p_{3/2} \text{ states},$$
$$C_{62} = -(3/4)\delta_{l0}.$$

The values of $G(Z\alpha)$ determined at $Z = 10, 20, \ldots, 110$ are interpolated using five-point Lagrangian interpolation to find $F(Z\alpha)$ for values of Z not included in Refs. 3 and 4. To determine the associated error we simply interpolate the numerical errors given[3,4] for $F(Z\alpha)$ at $Z = 10, 20, \ldots, 110$. For $Z < 10$ the errors were determined as described in Ref. 2. The values of $F(Z\alpha)$ so obtained are in accurate agreement with the interpolated results given by Mohr[1,2] in the range $1 \leqslant Z \leqslant 40$.

To determine the finite nuclear size corrections to the self-energy we calculated the self-energy in the field of a uniformly charged nucleus. Details of the numerical technique used are given in Refs. 5 and 6 and additional calculations are published in Ref. 7. By taking into account the finite nuclear size corrections in the electron propagator, values of the self-energy including finite size corrections are determined explicitly for the $1s_{1/2}$ states of elements in the second half of the periodic table. The differences with point nucleus values give the finite size corrections to the self-energy. The resulting corrections are fit to an empirical formula

$$\Delta F(\quad = -(ZR/a_0)^{2\gamma}(40.5 - 35.3(Z\alpha)^2), \tag{5}$$

where a_0 is the Bohr radius. This formula, which applies to the $1s_{1/2}$ state, permits one to estimate the finite size corrections for light elements where explicit calculations are unavailable. For $2s_{1/2}$ and $2p_{1/2}$ states we assume that the relative size of these corrections is the same as for the $1s_{1/2}$ states. This approximation is borne out by calculations of much lower accuracy and is found to be approximately valid also for the finite size corrections to the Uehling potential, which is discussed in the next section.

The errors in the finite size corrections for the $1s_{1/2}$ states are determined from the uncertainty in the numerical calculation of Ref. 6, while for the $2s_{1/2}$ and $2p_{1/2}$ states the error is assumed to be equal to the correction because of the low accuracy of the corresponding calculations. For the $2p_{3/2}$ states we assume that the finite size correction to the self-energy is negligible.

Vacuum polarization: Uehling potential. For an electron moving in the Coulomb field of a point nucleus the vacuum polarization corrections to the energy levels have been worked out to lowest order in α and to all orders in $Z\alpha$ by Wichmann and Kroll.[33] The dominant part of this correction for all values of Z is given by the expectation value of the Uehling potential.[34,35] We evaluate the energy shift due to the Uehling potential numerically using Dirac–Coulomb wave functions. The resulting numerical values of the energy shift are in precise agreement with the numerical values given by Mohr[4] for $Z = 10, 20, \ldots, 110$. To calculate the corrections to the Uehling potential due to finite nuclear size effects we employ the analytical expressions derived by Klarsfeld.[36] For the case of a uniform charge distribution of radius R the Uehling potential can be expressed as

$$V_{11}(r) = -\frac{\alpha Z\alpha}{2\pi R^3}\frac{1}{r}\left[\frac{2}{5}r\phi(2(R+r)) - \phi(2(R-r))\right] \quad (6a)$$

for $r \leqslant R$, and

$$V_{11}(r) = -\frac{\alpha Z\alpha}{2\pi R^3}\frac{1}{r}[\phi(2(r+R)) - \phi(2(r-R)) + R\chi_3(2(r-R))] \quad (6b)$$

for $r > R$, where

$$\phi(z) = \frac{1}{2}R\chi_3(z) + \frac{1}{4}\chi_4(z), \quad (7)$$

$$\chi_3(z) = \frac{1}{240}[(33z^2 + z^4)K_0(z) + (96z - 31z^3 - z^5)K_1(z) - (135z - 30z^3 - z^5)Ki_1(z)], \quad (8)$$

$$\chi_4(z) = \frac{1}{1440}[(225z - 48z^3 - z^5)K_0(z) - (351z^2 - 46z^4 - z^6)K_1(z) + (225 + 405z^2 - 45z^4 - z^6)Ki_1(z)]. \quad (9)$$

In the above equations $K_0(z)$ and $K_1(z)$ denote modified Bessel functions and $Ki_1(z)$ denotes a Bessel function integral.[37] Numerical values for $Ki_1(z)$ are easily obtained from the integral representation

$$Ki_1(z) = \int_0^{\pi/2} d\theta e^{-z/\cos\theta}. \quad (10)$$

The formulas (7) to (9) are used to evaluate the Uehling potential for the case of an extended nucleus; the point nucleus values are subtracted to give the finite size corrections to the Uehling potential listed in Table II. The error in these corrections results from the uncertainty in the nuclear radius.

Vacuum polarization: Wichmann–Kroll corrections. The corrections of order $\alpha(Z\alpha)^n$ with $n \geqslant 3$ to the Uehling potential have been considered by Wichmann and Kroll.[33] Following the methods employed by these authors Gyulassy,[38] Rinker et al. (see Ref. 39 and references therein), and Neghabian[40] have performed calculations on the vacuum polarization energy shift to all orders in $Z\alpha$, taking into account the finite extent of the nucleus from the beginning. As an approximation[38,40] the partial wave expansion of the electron propagator was restricted to states with Dirac angular momentum quantum numbers $\kappa = \pm 1$.

Our calculations of the Wichmann–Kroll terms[33] start from the explicit expression for the $\alpha(Z\alpha)^3$ term in the Laplace transform of the charge density derived for a point nucleus. Using this result Blomqvist[41] has derived the potential

$$V_{13}(r) = \frac{\alpha(Z\alpha)^3}{\pi r}\int_0^\infty dt\, e^{-2tr}\frac{1}{t^4}\left\{-\frac{1}{12}\pi^2[t^2-1]^{1/2}\theta(t-1) + \int_0^t dx\,[t^2-x^2]^{1/2}f(x)\right\},$$

$$f(x) = -2x\psi(x^2) - x\ln^2(1-x^2) + \frac{1-x^2}{x^2}\ln(1-x^2)\ln\frac{1+x}{1-x} + \frac{1-x^2}{4x}\ln^2\frac{1+x}{1-x} + \frac{2-x^2}{x(1-x^2)}\ln(1-x^2) + \frac{3-2x^2}{1-x^2}\ln\frac{1+x}{1-x} - 3x, \quad x<1,$$

$$f(x) = x^{-2}\psi(x^{-2}) - \frac{3x^2+1}{2x}[\psi(x^{-1}) - \psi(-x^{-1})] - \frac{2x^2-1}{2x^2}\left[\ln^2(1-x^{-2}) + \ln^2\frac{x+1}{x-1}\right] - (2x-1)\ln(1-x^{-2})\ln\frac{x+1}{x-1} + \frac{3x^2+1}{4x}\ln^2\frac{x+1}{x-1} - 2\ln x\ln(1-x^{-2}) - \frac{3x^2+1}{2x}\ln x\ln\frac{x+1}{x-1} + \left[5 - \frac{x(3x^2-2)}{x^2-1}\right]\ln(1-x^{-2}) + \left[\frac{3x^2+2}{x} - \frac{3x^2-2}{x^2-1}\right]\ln\frac{x+1}{x-1} + 3\ln x - 3, \quad x>1, \quad (11)$$

$$\psi(x) = -\int_0^x dx' \frac{\ln(1-x')}{x'} = \sum_{n=1}^{\infty} \frac{x^n}{n^2}, \quad -1 \leq x \leq 1, \tag{12}$$

$$\theta(x) = 0, \quad x < 0,$$
$$= 1, \quad x > 0. \tag{13}$$

The divergence in the integrand in Eq. (11) deserves closer inspection. The inner integral in (11) is a principal value integral. The divergent terms are separated out and integrated analytically, while the remaining finite and logarithmically divergent terms are integrated numerically. We obtained the potential $V_{13}(r)$ with an accuracy of five significant figures in this way. For $r \ll \lambda_e$, the electron Compton wavelength, this potential has already been tabulated by Vogel.[42] While Vogel's results are adequate for calculations of QED corrections in muonic atoms, they are insufficient for the corresponding calculations in hydrogen-like atoms. A very useful power series expansion for $V_{13}(r)$ appropriate for $r \ll \lambda_e$ was also given by Blomqvist.[41]

$$V_{13}(r) = \frac{\alpha(Z\alpha)^3}{\pi}\left\{\left(-\frac{2}{3}\zeta(3) + \frac{1}{6}\pi^2 - \frac{7}{9}\right)\frac{1}{r} + 2\pi\zeta(3)\right.$$
$$-\frac{1}{4}\pi^3 + \left(-6\zeta(3) + \frac{1}{16}\pi^4 + \frac{1}{6}\pi^2\right)r + \frac{2}{9}\pi r^2$$
$$\times(\ln r + \gamma_E) + \left(\frac{2}{3}\pi\zeta(3) + \frac{4}{9}\pi\ln 2 - \frac{31}{27}\pi\right)r^2$$
$$+\frac{1}{12}(\ln r + \gamma_E)^2 r^3 + \left(\frac{5}{54}\pi^2 - \frac{19}{36}\right)(\ln r + \gamma_E)r^3$$
$$\left.+\left(\frac{13}{18}\zeta(3) - \frac{109}{432}\pi^2 + \frac{859}{864}\right)r^3 + \cdots\right. \tag{14}$$

Here ζ is the Riemann zeta function,[37] and $\gamma_E \approx 0.57722$ is Euler's constant. The asymptotic form of $V_{13}(r)$ is given by (see Ref. 43)

$$V_{13}(r) = -\frac{\alpha(Z\alpha)^3}{\pi r}\frac{32}{225}\frac{1}{(2r)^4} + \cdots. \tag{15}$$

Higher-order corrections to the Uehling potential, of order $(Z\alpha)^5$ and $(Z\alpha)^7$, were also considered by Wichmann and Kroll[33] and by Blomqvist.[41] We use

$$V_{15}(r) \approx 0.3401(Z\alpha)^2 V_{13}(r), \tag{16}$$

$$V_{17}(r) \approx 0.1763(Z\alpha)^4 V_{13}(r) \tag{17}$$

to estimate the error associated with the third-order corrections listed in Table II. Vacuum polarization corrections of order $(Z\alpha)^n$ with $n \geq 9$ were not included in the tabulation, nor were finite-size corrections to the Wichmann–Kroll terms.

Finite nuclear size. The finite extent of the nucleus modifies the short-distance behavior of the Coulomb potential. In our calculations the nuclear charge distribution is assumed to be well represented by that of a homogeneously charged sphere of radius R. To determine the nuclear size correction to the eigenvalue of the bound electron we solved numerically the radial Dirac equations for the $1s_{1/2}$, $2s_{1/2}$, $2p_{1/2}$, and $2p_{3/2}$ states for the corresponding potential. The criterion for finding the eigenvalues of the radial Dirac equation was set to $\Delta E/E \leq 10^{-12}$. This accuracy was sufficient to allow us to determine the finite nuclear size corrections given in Table II. The uncertainty in the finite size corrections given in the table is due to the uncertainty in the nuclear radii.

For comparison purposes we also considered a Fermi distribution for the nuclear charge density.

$$\rho(r) = \frac{\rho_0}{1 + \exp[(r-c)(4\ln 3)/t]}. \tag{18}$$

The quantity c is the half-density radius which gives the distance to the point at which the nuclear charge density is one-half of its maximum value, and the parameter t is the skin thickness which is the distance over which the charge density falls from 90% to 10% of its maximum value. The Fermi distribution with $t = 0$ reduces to a uniform distribution with $R = c$. ρ_0 follows from the normalization condition for the total nuclear charge. We found that even for the heaviest elements the Fermi distribution yielded the same result for the energy eigenvalue within the quoted uncertainty as the uniform distribution provided that the root-mean-square radii $\langle r^2\rangle^{1/2}$ of both charge distributions were chosen to be identical. For a homogeneously charged sphere we have the simple relationship

$$\langle r^2\rangle^{1/2} = \sqrt{3/5}\, R. \tag{19}$$

Experimental values for nuclear radii and their uncertainties were taken from Refs. 44 and 45. The corresponding root-mean-square radii are given in the subheadings in Table II. They are illustrated in Fig. 1 versus the nucleon number A. For those elements for which no accurate experimental radii were available we employed the empirical expression

$$\langle r^2\rangle^{1/2} = 0.836\, A^{1/3} + 0.570\ (\pm 0.05)\ \text{fermi}, \tag{20}$$

which is plotted as a solid line in Fig. 1. The formula (20) represents a weighted fit to the measured root-mean-square radii for $A > 9$. For the heaviest elements the uncertainty in the nuclear radius dominates the total error in the Lamb shift.

Processes related to intrinsic degrees of freedom of the nucleus, such as the hyperfine interaction or nuclear polarizability, are not considered in this paper.

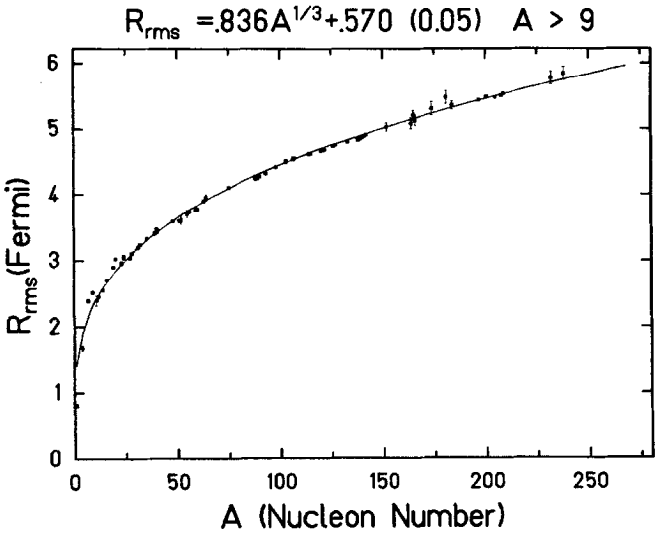

Fig. 1. Root-mean-square radii $\langle r^2\rangle^{1/2}$ of the most abundant nuclei, in fermi, versus the nucleon number A. The experimental data are taken from Refs. 44 and 45. The solid line represents a weighted fit to the measured root-mean-square radii for $A > 9$. The corresponding two-parameter interpolation formula for the root-mean-square radii, in fermi, is quoted at the top of the figure. Its accuracy was found to be better than 0.05 fermi.

Higher-order QED corrections. Radiative corrections to one-electron energies due to the exchange of two virtual photons have been worked out analytically to lowest order in $Z\alpha$. These corrections, which may be expressed in terms of the function $F(Z\alpha)$ introduced in Eq. (3), consist of three parts:

A vacuum polarization contribution,[46]

$$F_{VP}(Z\alpha) = (\alpha/\pi)(-82/81)\delta_{l0}; \tag{21}$$

A vacuum fluctuation contribution,[47,48]

$$F_{VF}(Z\alpha) = (\alpha/\pi)(-4819/1296 - (49/108)\pi^2 + 2\pi^2 \ln 2 - 3\zeta(3))\delta_{l0}; \tag{22}$$

An anomalous moment contribution,[49,50]

$$F_{AM}(Z\alpha) = (\alpha/\pi)C_{jl}/(2l+1)(197/144 + \pi^2/12 - (\pi^2/2)\ln 2 + (3/4)\zeta(3)). \tag{23}$$

In these equations $\zeta(3) = 1.202050569$ is the Riemann zeta function. The sum of these three terms is listed in Table II as the higher-order (H.O.) contribution. Since $Z\alpha$ corrections to these higher-order terms have not been worked out, we follow the prescription of Ref. 1 and assume that the corresponding uncertainty is equal to the value for $Z \geqslant 10$. For lower Z we assume that the uncertainty scales as Z^2.

Relativistic recoil and relativistic reduced mass corrections. The relativistic recoil and relativistic reduced mass terms are corrections of orders Zm/M and m/M, respectively, to the radiative corrections discussed previously. These contributions have been worked out analytically to lowest order in $Z\alpha$ and can be written in terms of the function $F(Z\alpha)$ as:

Relativistic recoil[51,52]

$$\begin{aligned} F_{RR}(Z\alpha) &= (mZ/M)[(1/3)\ln(Z\alpha)^{-2} + (8/3)\,L_{1s} \\ &\quad + 62/9 + (14/3)\ln 2], && \text{for } 1s \text{ states,} \\ &= (mZ/M)[(1/3)\ln(Z\alpha)^{-2} + (8/3)L_{2s} + 187/18], && \text{for } 2s \text{ states,} \\ &= (mZ/M)[(8/3)L_{2p} - 7/18], && \text{for } 2p \text{ states.} \end{aligned} \tag{24}$$

Relativistic reduced mass[48]

$$\begin{aligned} F_{RM}(Z\alpha) &= -(m/M)[4\ln(Z\alpha)^{-2} + 4L_{ns} + 6/5] && \text{for } ns \text{ states,} \\ &= -(m/M)[4L_{np} - 1/3] && \text{for } np_{1/2} \text{ states,} \\ &= -(m/M)[4L_{np} + 1/6] && \text{for } np_{3/2} \text{ states.} \end{aligned} \tag{25}$$

In Eqs. (24) and (25) the quantities L_{nl} are the Bethe logarithms defined previously. Since the higher-order $Z\alpha$ corrections to Eqs. (24) and (25) have not been considered, we again assume that the uncertainties in the contributions are equal to their values for $Z \geqslant 10$ and scale the uncertainties with Z^2 for lower values of Z.

Summary and Conclusions

In Fig. 2 we summarize graphically the contributions to the $1s_{1/2}$ Lamb shift given in Table II. This figure illustrates the well-known fact that the point-nucleus self-energy and the point-nucleus Uehling potential yield the dominant contributions to the Lamb

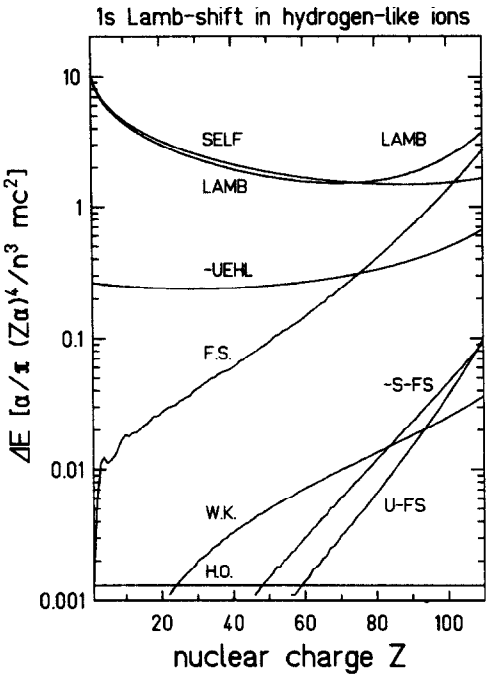

Fig. 2. Contributions to the Lamb shift of $1s_{1/2}$ electrons in hydrogen-like atoms versus the nucleYrcharge number Z. The energy shift ΔE is presented in units of $(\alpha/\pi)[(Z\alpha)^4/n^3]\ mc^2$. LAMB indicates the sum of all contributions considered in Table II. The dominant term (SELF) is provided by the point-nucleus self-energy shift. UEHL denotes the level shift caused by the Uehling potential for point-like nuclei. The energy correction F.S. results from the finite size of the nucleus. The slight irregularities reflect the noncontinuous dependence of the nuclear radius R on the charge number Z. The finite nuclear size corrections to the self-energy and to the Uehling potential lead to the energy shifts S-FS and U-FS, respectively. W.K. denotes the Wichmann-Kroll term and H.O. signifies higher-order corrections incorporating the exchange of two photons. Most of the contributions as well as the total Lamb shift are repulsive. Attractive contributions are indicated by a minus sign.

shift for low and intermediate values of Z. The figure also illustrates the fact that nuclear finite size corrections become as important as the self-energy toward the end of the periodic table.

Because of the importance of nuclear size corrections at high Z, the precision of our tabulated values of the Lamb shift in this range is limited mainly by uncertainties in nuclear root-mean-square radii. The quoted errors in our final energies could be reduced substantially if more precise data on nuclear radii of the type summarized in Refs. 44 and 45 were available. Furthermore, it would be worthwhile to measure the Lamb shift for various isotopes of high-Z elements in order to disentangle the nuclear size effects from the radiative corrections.

A second important source of theoretical error at high Z is due to the omission of terms of order $(Z\alpha)^9$ and higher in our evaluation of the Wichmann-Kroll corrections. To include these terms would require a reinvestigation of the vacuum polarization potential, ideally employing a propagator for an electron moving in the field of an extended nucleus, instead of a Coulomb field propagator. To determine more accurately the finite size corrections to the self-energy, further numerical studies along the lines of Refs. 6 and 7 are required, particularly for the $n = 2$ states.

Acknowledgments

We are grateful to Professor Walter Greiner for fruitful discussions and for his continuous support. We are also indebted to P. J. Mohr for helpful advice. In addition we are grateful to our experimental colleagues for stimulating this work. The work of W.R.J. was supported partially by the NSF under Grant PHY83-08136 and partially by the Alexander von Humboldt Stiftung. G.S. acknowledges the support of the Deutsche Forschungsgemeinschaft (Heisenberg Programm).

References

1. P. J. Mohr, ATOMIC DATA AND NUCLEAR DATA TABLES **29,** 453 (1983)
2. P. J. Mohr, in *Beam-Foil Spectroscopy,* edited by I. Sellin and D. J. Pegg (Plenum, New York, 1976), Vol. 1, p. 89
3. P. J. Mohr, Ann. Phys. (N. Y.) **88,** 26, 52 (1974)
4. P. J. Mohr, Phys. Rev. A **26,** 2338 (1982)
5. A. M. Desiderio and W. R. Johnson, Phys. Rev. A **3,** 1267 (1971)
6. K. T. Cheng and W. R. Johnson, Phys. Rev. A **14,** 1943 (1976)
7. G. Soff, P. Schlüter, B. Müller, and W. Greiner, Phys. Rev. Lett. **48,** 1465 (1982)
8. G. W. Erickson, J. Phys. Chem. Ref. Data **6,** 831 (1977)
9. H. W. Kugel and D. E. Murnick, Rep. Prog. Phys. **40,** 297 (1977)
10. O. R. Wood, C. K. N. Patel, D. E. Murnick, E. T. Nelson, M. Leventhal, H. W. Kugel, and Y. Niv, Phys. Rev. Lett. **48,** 398 (1982)
11. P. Pellegrin, Y. El Masri, L. Palffy, and R. Prieels, Phys. Rev. Lett. **49,** 1762 (1982)
12. J. P. Briand, M. Tavernier, P. Indelicato, R. Marrus, and H. Gould, Phys. Rev. Lett. **50,** 832 (1983)

13. E. Källne, J. Källne, P. Richard, M. Stöckli, J. Phys. B **17,** L115 (1984)

14. H. D. Sträter, L. von Gerdtell, A. P. Georgiadis, D. Müller, P. von Brentano, J. C. Sens, and A. Pape, Phys. Rev. A **29,** 1596 (1984)

15. H. Gould and R. Marrus, Phys. Rev. A **28,** 2001 (1983)

16. J. P. Briand, J. P. Mosse, P. Indelicato, P. Chevallier, D. Girard-Vernhet, A. Chetioui, M. T. Ramos, and J. P. Desclaux, Phys. Rev. A **28,** 1413 (1983)

17. P. Richard, M. Stöckli, R. D. Deslattes, P. Cowan, R. E. LaVilla, B. Johnson, K. Jones, M. Meron, R. Mann, and K.-H. Schartner, Phys. Rev. A **29,** 2939 (1984)

18. H. F. Beyer, P. H. Mokler, R. D. Deslattes, F. Folkmann, and K.-H. Schartner, Z. Phys. A **318,** 249 (1984)

19. J. P. Briand, P. Indelicato, M. Tavernier, O. Gorceix, D. Liesen, H. F. Beyer, B. Liu, A. Warczak, and J. P. Desclaux, Z. Phys. A **318,** 1 (1984)

20. V. Zacek, H. Bohn, H. Brum, T. Faestermann, F. v. Feilitzsch, G. Giorginis, P. Kienle, and S. Schuhbeck, Z. Phys. A **318,** 7 (1984)

21. H. F. Beyer, R. D. Deslattes, F. Folkmann, and R. E. LaVilla, J. Phys. **B 18,** 207 (1985)

22. S. R. Lundeen and F. M. Pipkin, Phys. Rev. Lett. **46,** 232 (1981)

23. H. Gould, D. Greiner, P. Lindstrom, T. J. M. Symons, and H. Crawford, Phys. Rev. Lett. **52,** 180 (1984)

24. S. P. Goldman and G. W. F. Drake, J. Phys. B **17,** L197 (1984)

25. D. C. Tsui, A. C. Gossard, B. F. Field, M. E. Cage, and R. F. Dziuba, Phys. Rev. Lett. **48,** 3 (1982)

26. S. R. Amin, D. C. Caldwell, and W. Lichten, Phys. Rev. Lett. **47,** 1234 (1981)

27. K. Bechert and J. Meixner, Ann. Physik **22,** 525 (1935)

28. G. Breit and G. E. Brown, Phys. Rev. **74,** 1278 (1948)

29. E. R. Cohen and B. N. Taylor, J. Phys. Chem. Ref. Data **2,** 663 (1973)

30. G. W. Erickson and D. R. Yennie, Ann. Phys. (N. Y.) **35,** 447 (1965)

31. G. W. Erickson, Phys. Rev. Lett. **27,** 780 (1971)

32. J. Sapirstein, Phys. Rev. Lett. **47,** 1723 (1981)

33. E. H. Wichmann and N. M. Kroll, Phys. Rev. **101,** 843 (1956)

34. E. A. Uehling, Phys. Rev. **48,** 55 (1935)

35. R. Serber, Phys. Rev. **48,** 49 (1935)

36. S. Klarsfeld, Phys. Lett. B **66,** 86 (1977)

37. M. Abramowitz and I. A. Stegun, *Handbook of Mathematical Functions* (Dover, New York, 1965)

38. M. Gyulassy, Nucl. Phys. A **244,** 497 (1975)

39. E. Borie and G. A. Rinker, Rev. Mod. Phys. **54,** 67 (1982)

40. A. R. Neghabian, Phys. Rev. A **27,** 2311 (1983)

41. J. Blomqvist, Nucl. Phys. B **48,** 95 (1972)

42. P. Vogel, ATOMIC DATA AND NUCLEAR DATA TABLES **14,** 599 (1974)

43. K.-N. Huang, Phys. Rev. A **14,** 1311 (1976)

44. C. W. de Jager, H. de Vries, and C. de Vries, ATOMIC DATA AND NUCLEAR DATA TABLES **14,** 479 (1974)

45. R. Engfer, H. Schneuwly, J. L. Vuilleumier, H. K. Walter, and A. Zehnder, ATOMIC DATA AND NUCLEAR DATA TABLES **14,** 509 (1974)

46. M. Baranger, F. J. Dyson, and E. E. Salpeter, Phys. Rev. **88,** 680 (1952)

47. T. Appelquist and S. J. Brodsky, Phys. Rev. Lett. **24,** 562 (1970); Phys. Rev. A **2,** 2293 (1970)

48. B. E. Lautrup, A. Petermann, and E. de Rafael, Phys. Rep. **3,** 193 (1972)

49. C. M. Sommerfield, Phys. Rev. **107,** 328 (1957)

50. A. Petermann, Helv. Phys. Acta **30,** 407 (1957); Nucl. Phys. **3,** 689 (1957)

51. G. W. Erickson and D. R. Yennie, Ann. Phys. (N. Y.) **35,** 271 (1965)

52. H. Grotch and D. R. Yennie, Rev. Mod. Phys. **41,** 350 (1969)

EXPLANATION OF TABLES

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

All energies are in units of cm^{-1}.

$1s_{1/2}$	Column containing the binding energy $E(1s_{1/2})$
$2p_{1/2}$–$1s_{1/2}$	Column containing $E(2p_{1/2})-E(1s_{1/2})$
$2s_{1/2}$–$2p_{1/2}$	Column containing $E(2s_{1/2})-E(2p_{1/2})$
$2p_{3/2}$–$2p_{1/2}$	Column containing $E(2p_{3/2})-E(2p_{1/2})$
H, He, · · ·	Element symbol
Z	Nuclear charge number
M	Nuclear mass in a.m.u.
RMS	Nuclear root-mean-square radius $\langle r^2\rangle^{1/2}$ and uncertainty, in fermi
R	Nuclear equivalent radius (homogeneously charged sphere) and uncertainty, in fermi
COUL	Binding energy or transition energies according to the Dirac equation assuming point nuclei
R.M.	Reduced mass corrections
LAMB	Lamb-shift corrections
SUM	Total binding energy or transition energies. The integer on the right-hand side of the quoted energy is the uncertainty in the last figure(s).

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

The function $F(Z\alpha)$ is presented. The corresponding energy shift is given by

$$\Delta E = (\alpha/\pi)[(Z\alpha)^4/n^3]F(Z\alpha)\, mc^2$$

$1s_{1/2}$	Column containing Lamb-shift effects for the $1s_{1/2}$ level
$2s_{1/2}$	Column containing Lamb-shift effects for the $2s_{1/2}$ level
$2p_{1/2}$	Column containing Lamb-shift effects for the $2p_{1/2}$ level
$2p_{3/2}$	Column containing Lamb-shift effects for the $2p_{3/2}$ level
Z	Nuclear charge number
SELF	Self-energy correction assuming point nuclei
S-FS	Nuclear size effect on the self-energy correction
UEHL	Shift due to the Uehling potential assuming point nuclei
U-FS	Nuclear size effect on the Uehling potential correction
W.K.	Wichmann–Kroll terms, higher-order vacuum polarization corrections
H.O.	Higher-order radiative corrections in α/π
F.S.	Nuclear size correction to the Dirac energy
R.R.	Relativistic recoil correction
R-RM	Relativistic reduced mass correction, reduced mass correction to the self-energy
LAMB	Sum of all contributions

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leqslant Z \leqslant 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$	$2p_{1/2}$-$1s_{1/2}$	$2s_{1/2}$-$2p_{1/2}$	$2p_{3/2}$-$2p_{1/2}$
H	Z = 1	M = 1.00728	RMS = 0.809(20)	R = 1.044(26)
COUL	-109738776164.E-6	82303990813.E-6	0.	36524104.E-8
R.M.	59732344.E-6	-44799059.E-6	0.	-19881.E-8
LAMB	272624.E-6	-273052.E-6	352868.E-7	84581.E-8
SUM	-109678771196.E-6 5	82258918702.E-6 5	352868.E-7 7	36588804.E-8 2
He	Z = 2	M = 4.00151	RMS = 1.673(40)	R = 2.160(52)
COUL	-4389726380.E-4	3292280174.E-4	0.	58444402.E-7
R.M.	601688.E-4	-451258.E-4	0.	-8011.E-7
LAMB	35926.E-4	-35994.E-4	46840.E-5	135282.E-7
SUM	-4389088766.E-4 2	3291792922.E-4 2	46840.E-5 2	58571673.E-7 9
Li	Z = 3	M = 7.01436	RMS = 2.392(29)	R = 3.088(37)
COUL	-987754199.E-3	740808251.E-3	0.	2959240.E-5
R.M.	77235.E-3	-57924.E-3	0.	-231.E-5
LAMB	15956.E-3	-15990.E-3	20922.E-4	6839.E-5
SUM	-987661008.E-3 1	740734337.E-3 1	20922.E-4 2	2965848.E-5 6
Be	Z = 4	M = 9.00999	RMS = 2.519(12)	R = 3.252(15)
COUL	-1756171197.E-3	1317105011.E-3	0.	935484.E-4
R.M.	106897.E-3	-80167.E-3	0.	-57.E-4
LAMB	45507.E-3	-45615.E-3	59972.E-4	2158.E-4
SUM	-1756018793.E-3 5	1316979229.E-3 5	59972.E-4 9	937585.E-4 2
B	Z = 5	M = 11.0066	RMS = 2.397(76)	R = 3.095(98)
COUL	-274434656.E-2	205820281.E-2	0.	2284582.E-4
R.M.	13673.E-2	-10254.E-2	0.	-114.E-4
LAMB	10193.E-2	-10219.E-2	13495.E-3	5257.E-4
SUM	-274410790.E-2 2	205799808.E-2 2	13495.E-3 3	2289724.E-4 9
C	Z = 6	M = 11.9967	RMS = 2.455(5)	R = 3.169(6)
COUL	-395243851.E-2	296421041.E-2	0.	473904.E-3
R.M.	18064.E-2	-13546.E-2	0.	-22.E-3
LAMB	19620.E-2	-19673.E-2	26084.E-3	1088.E-3
SUM	-395206167.E-2 5	296387822.E-2 5	26084.E-3 7	474970.E-3 2
N	Z = 7	M = 13.9992	RMS = 2.549(12)	R = 3.291(15)
COUL	-53806407.E-1	40352609.E-1	0.	878347.E-3
R.M.	2107.E-1	-1580.E-1	0.	-34.E-3
LAMB	3402.E-1	-3412.E-1	4541.E-2	2010.E-3
SUM	-53800898.E-1 1	40347618.E-1 1	4541.E-2 2	880323.E-3 5
O	Z = 8	M = 15.9905	RMS = 2.711(14)	R = 3.500(18)
COUL	-70291823.E-1	52715119.E-1	0.	1499171.E-3
R.M.	2409.E-1	-1806.E-1	0.	-51.E-3
LAMB	5467.E-1	-5483.E-1	7325.E-2	3420.E-3
SUM	-70283947.E-1 2	52707829.E-1 2	7325.E-2 3	1502540.E-3 9

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
F	Z = 9		M = 18.9935		RMS = 2.900(15)		R = 3.744(19)	
COUL	-88983283.E-1		66731456.E-1		0.		240275.E-2	
R.M.	2567.E-1		-1925.E-1		0.		-7.E-2	
LAMB	8291.E-1		-8317.E-1		11151.E-2		546.E-2	
SUM	-88972425.E-1	4	66721213.E-1	4	11151.E-2	6	240814.E-2	2
Ne	Z = 10		M = 19.987		RMS = 3.024(20)		R = 3.904(26)	
COUL	-109883797.E-1		82403687.E-1		0.		366449.E-2	
R.M.	3012.E-1		-2258.E-1		0.		-10.E-2	
LAMB	12013.E-1		-12052.E-1		1621.E-1		830.E-2	
SUM	-109868772.E-1	7	82389376.E-1	7	1621.E-1	1	367269.E-2	3
Na	Z = 11		M = 22.984		RMS = 2.963(29)		R = 3.825(37)	
COUL	-13299674.E0		9973413.E0		0.		536894.E-2	
R.M.	317.E0		-238.E0		0.		-13.E-2	
LAMB	1677.E0		-1682.E0		2271.E-1		1212.E-2	
SUM	-13297680.E0	1	9971493.E0	1	2271.E-1	1	538093.E-2	5
Mg	Z = 12		M = 23.978		RMS = 3.054(34)		R = 3.943(44)	
COUL	-15832584.E0		11872535.E0		0.		760987.E-2	
R.M.	362.E0		-271.E0		0.		-17.E-2	
LAMB	2272.E0		-2280.E0		3088.E-1		1711.E-2	
SUM	-15829950.E0	1	11869985.E0	1	3088.E-1	2	762680.E-2	6
Al	Z = 13		M = 26.974		RMS = 3.041(14)		R = 3.926(18)	
COUL	-18587520.E0		13938018.E0		0.		1049033.E-2	
R.M.	377.E0		-283.E0		0.		-21.E-2	
LAMB	3000.E0		-3010.E0		4091.E-1		2349.E-2	
SUM	-18584143.E0	2	13934725.E0	2	4091.E-1	3	1051360.E-2	9
Si	Z = 14		M = 27.969		RMS = 3.107(26)		R = 4.011(34)	
COUL	-21564931.E0		16170168.E0		0.		141228.E-1	
R.M.	422.E0		-316.E0		0.		-3.E-1	
LAMB	3878.E0		-3892.E0		5306.E-1		315.E-1	
SUM	-21560631.E0	2	16165960.E0	2	5306.E-1	3	141540.E-1	1
P	Z = 15		M = 30.966		RMS = 3.197(5)		R = 4.127(6)	
COUL	-24765301.E0		18569319.E0		0.		186293.E-1	
R.M.	437.E0		-328.E0		0.		-3.E-1	
LAMB	4921.E0		-4939.E0		6756.E-1		414.E-1	
SUM	-24759942.E0	3	18564051.E0	3	6756.E-1	4	186703.E-1	2
S	Z = 16		M = 31.963		RMS = 3.247(4)		R = 4.192(5)	
COUL	-28189153.E0		21135830.E0		0.		241414.E-1	
R.M.	482.E0		-361.E0		0.		-4.E-1	
LAMB	6146.E0		-6168.E0		8464.E-1		534.E-1	
SUM	-28182526.E0	4	21129300.E0	4	8464.E-1	5	241944.E-1	2

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Cl	Z = 17		M = 34.960		RMS = 3.335(18)		R = 4.305(23)	
COUL	-31837049.E0		23870087.E0		0.		308007.E-1	
R.M.	498.E0		-373.E0		0.		-5.E-1	
LAMB	7568.E0		-7597.E0		10456.E-1		678.E-1	
SUM	-31828983.E0	5	23862117.E0	5	10456.E-1	7	308680.E-1	3
A	Z = 18		M = 39.953		RMS = 3.428(8)		R = 4.426(10)	
COUL	-35709589.E0		26772502.E0		0.		387585.E-1	
R.M.	488.E0		-366.E0		0.		-5.E-1	
LAMB	9206.E0		-9241.E0		12757.E-1		849.E-1	
SUM	-35699895.E0	6	26762896.E0	6	12757.E-1	8	388428.E-1	3
K	Z = 19		M = 38.953		RMS = 3.407(25)		R = 4.398(32)	
COUL	-39807411.E0		29843514.E0		0.		481762.E-1	
R.M.	558.E0		-418.E0		0.		-7.E-1	
LAMB	11069.E0		-11111.E0		1539.E0		1049.E-1	
SUM	-39795784.E0	7	29831985.E0	7	1539.E0	1	482805.E-1	4
Ca	Z = 20		M = 39.952		RMS = 3.476(7)		R = 4.487(9)	
COUL	-44131196.E0		33083590.E0		0.		592257.E-1	
R.M.	603.E0		-451.E0		0.		-8.E-1	
LAMB	13184.E0		-13234.E0		1838.E0		1284.E-1	
SUM	-44117409.E0	8	33069905.E0	8	1838.E0	1	593533.E-1	5
Sc	Z = 21		M = 44.944		RMS = 3.542(50)		R = 4.573(65)	
COUL	-4868166.E1		3649322.E1		0.		720891.E-1	
R.M.	59.E1		-44.E1		0.		-9.E-1	
LAMB	1556.E1		-1562.E1		2177.E0		1554.E-1	
SUM	-4866551.E1	1	3647716.E1	1	2177.E0	2	722436.E-1	6
Ti	Z = 22		M = 47.936		RMS = 3.599(9)		R = 4.646(12)	
COUL	-5345957.E1		4007294.E1		0.		869592.E-1	
R.M.	61.E1		-45.E1		0.		-10.E-1	
LAMB	1823.E1		-1830.E1		2556.E0		1864.E-1	
SUM	-5344074.E1	1	4005419.E1	1	2556.E0	2	871447.E-1	7
V	Z = 23		M = 50.931		RMS = 3.602(25)		R = 4.650(32)	
COUL	-5846573.E1		4382328.E1		0.		1040398.E-1	
R.M.	63.E1		-47.E1		0.		-11.E-1	
LAMB	2118.E1		-2126.E1		2980.E0		2218.E-1	
SUM	-5844392.E1	1	4380155.E1	1	2980.E0	2	1042604.E-1	9
Cr	Z = 24		M = 51.927		RMS = 3.612(61)		R = 4.663(79)	
COUL	-6370097.E1		4774484.E1		0.		123545.E0	
R.M.	67.E1		-50.E1		0.		-1.E0	
LAMB	2445.E1		-2455.E1		3450.E0		262.E0	
SUM	-6367585.E1	2	4771979.E1	2	3450.E0	3	123806.E0	1

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leqslant Z \leqslant 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Mn	Z = 25		M = 54.927		RMS = 3.705(55)		R = 4.783(71)	
COUL	-6916619.E1		5183822.E1		0.		145702.E0	
R.M.	69.E1		-51.E1		0.		-1.E0	
LAMB	2807.E1		-2818.E1		3972.E0		307.E0	
SUM	-6913743.E1	2	5180952.E1	2	3972.E0	3	146008.E0	1
Fe	Z = 26		M = 55.921		RMS = 3.736(3)		R = 4.823(4)	
COUL	-7486232.E1		5610405.E1		0.		170748.E0	
R.M.	73.E1		-54.E1		0.		-2.E0	
LAMB	3204.E1		-3216.E1		4546.E0		358.E0	
SUM	-7482955.E1	2	5607135.E1	2	4546.E0	3	171104.E0	1
Co	Z = 27		M = 58.918		RMS = 3.782(34)		R = 4.883(44)	
COUL	-8079034.E1		6054302.E1		0.		198932.E0	
R.M.	74.E1		-56.E1		0.		-2.E0	
LAMB	3638.E1		-3652.E1		5176.E0		414.E0	
SUM	-8075321.E1	3	6050595.E1	3	5176.E0	4	199344.E0	2
Ni	Z = 28		M = 57.920		RMS = 3.776(20)		R = 4.875(26)	
COUL	-8695126.E1		6515582.E1		0.		230515.E0	
R.M.	82.E1		-61.E1		0.		-2.E0	
LAMB	4110.E1		-4125.E1		5864.E0		477.E0	
SUM	-8690935.E1	3	6511396.E1	3	5864.E0	5	230989.E0	2
Cu	Z = 29		M = 62.914		RMS = 3.898(7)		R = 5.032(9)	
COUL	-9334617.E1		6994318.E1		0.		265772.E0	
R.M.	80.E1		-60.E1		0.		-2.E0	
LAMB	4627.E1		-4644.E1		6619.E0		546.E0	
SUM	-9329909.E1	3	6989614.E1	3	6619.E0	5	266315.E0	2
Zn	Z = 30		M = 63.913		RMS = 3.955(47)		R = 5.106(61)	
COUL	-9997616.E1		7490587.E1		0.		304988.E0	
R.M.	85.E1		-63.E1		0.		-3.E0	
LAMB	5186.E1		-5204.E1		7438.E0		622.E0	
SUM	-9992345.E1	4	7485319.E1	4	7438.E0	7	305608.E0	2
Ga	Z = 31		M = 68.909		RMS = 3.998(50)		R = 5.161(65)	
COUL	-10684241.E1		8004469.E1		0.		348464.E0	
R.M.	84.E1		-63.E1		0.		-3.E0	
LAMB	5789.E1		-5809.E1		8325.E0		706.E0	
SUM	-10678368.E1	5	7998597.E1	5	8325.E0	8	349168.E0	3
Ge	Z = 32		M = 73.904		RMS = 4.079(50)		R = 5.266(65)	
COUL	-11394614.E1		8536047.E1		0.		396513.E0	
R.M.	83.E1		-62.E1		0.		-3.E0	
LAMB	6442.E1		-6464.E1		9288.E0		798.E0	
SUM	-11388088.E1	5	8529521.E1	6	9288.E0	9	397308.E0	3

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
As	Z = 33		M = 74.903		RMS = 4.104(2)		R = 5.298(3)	
COUL	-12128860.E1		9085408.E1		0.		449460.E0	
R.M.	88.E1		-65.E1		0.		-3.E0	
LAMB	7142.E1		-7165.E1		10323.E0		897.E0	
SUM	-12121631.E1	5	9078178.E1	5	10323.E0	9	450355.E0	4
Se	Z = 34		M = 79.898		RMS = 4.171(50)		R = 5.385(65)	
COUL	-12887112.E1		9652642.E1		0.		507648.E0	
R.M.	87.E1		-65.E1		0.		-3.E0	
LAMB	7896.E1		-7921.E1		1144.E1		1006.E0	
SUM	-12879128.E1	7	9644656.E1	7	1144.E1	1	508650.E0	4
Br	Z = 35		M = 78.899		RMS = 4.156(50)		R = 5.365(65)	
COUL	-13669506.E1		10237843.E1		0.		571430.E0	
R.M.	94.E1		-70.E1		0.		-4.E0	
LAMB	8698.E1		-8724.E1		1264.E1		1123.E0	
SUM	-13660714.E1	8	10229049.E1	8	1264.E1	1	572549.E0	5
Kr	Z = 36		M = 83.892		RMS = 4.230(50)		R = 5.461(65)	
COUL	-14476185.E1		10841108.E1		0.		641177.E0	
R.M.	93.E1		-69.E1		0.		-4.E0	
LAMB	9564.E1		-9592.E1		1393.E1		1250.E0	
SUM	-14466528.E1	9	10831447.E1	10	1393.E1	1	642423.E0	5
Rb	Z = 37		M = 84.892		RMS = 4.245(50)		R = 5.480(65)	
COUL	-1530730.E2		1146254.E2		0.		717275.E0	
R.M.	10.E2		-7.E2		0.		-5.E0	
LAMB	1048.E2		-1051.E2		1530.E1		1386.E0	
SUM	-1529672.E2	1	1145196.E2	1	1530.E1	2	718657.E0	6
Sr	Z = 38		M = 87.885		RMS = 4.242(36)		R = 5.476(46)	
COUL	-1616300.E2		1210224.E2		0.		800125.E0	
R.M.	10.E2		-7.E2		0.		-5.E0	
LAMB	1146.E2		-1149.E2		1677.E1		1534.E0	
SUM	-1615144.E2	1	1209068.E2	1	1677.E1	2	801654.E0	6
Y	Z = 39		M = 88.884		RMS = 4.244(2)		R = 5.479(3)	
COUL	-1704344.E2		1276033.E2		0.		890145.E0	
R.M.	10.E2		-8.E2		0.		-5.E0	
LAMB	1250.E2		-1253.E2		1834.E1		1691.E0	
SUM	-1703084.E2	1	1274772.E2	1	1834.E1	2	891830.E0	7
Zr	Z = 40		M = 89.883		RMS = 4.273(1)		R = 5.516(1)	
COUL	-1794880.E2		1343690.E2		0.		987769.E0	
R.M.	11.E2		-8.E2		0.		-6.E0	
LAMB	1361.E2		-1364.E2		2001.E1		1859.E0	
SUM	-1793509.E2	1	1342318.E2	1	2001.E1	2	989622.E0	8

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Nb	Z = 41		M = 92.884		RMS = 4.318(3)		R = 5.575(4)	
COUL	-1887924.E2		1413209.E2		0.		1093449.E0	
R.M.	11.E2		-8.E2		0.		-6.E0	
LAMB	1479.E2		-1482.E2		2180.E1		2039.E0	
SUM	-1886434.E2	1	1411719.E2	1	2180.E1	2	1095482.E0	9
Mo	Z = 42		M = 97.882		RMS = 4.415(6)		R = 5.700(8)	
COUL	-1983495.E2		1484602.E2		0.		120766.E1	
R.M.	11.E2		-8.E2		0.		-1.E1	
LAMB	1606.E2		-1609.E2		2372.E1		223.E1	
SUM	-1981878.E2	2	1482985.E2	2	2372.E1	2	120988.E1	1
Tc	Z = 43		M = 96.883		RMS = 4.410(50)		R = 5.693(65)	
COUL	-2081610.E2		1557880.E2		0.		133088.E1	
R.M.	12.E2		-9.E2		0.		-1.E1	
LAMB	1737.E2		-1740.E2		2572.E1		243.E1	
SUM	-2079861.E2	2	1556131.E2	2	2572.E1	3	133330.E1	1
Ru	Z = 44		M = 101.880		RMS = 4.475(50)		R = 5.777(65)	
COUL	-2182290.E2		1633058.E2		0.		146362.E1	
R.M.	11.E2		-9.E2		0.		-1.E1	
LAMB	1879.E2		-1882.E2		2788.E1		265.E1	
SUM	-2180399.E2	2	1631168.E2	3	2788.E1	4	146626.E1	1
Rh	Z = 45		M = 102.880		RMS = 4.502(30)		R = 5.812(39)	
COUL	-2285553.E2		1710148.E2		0.		160642.E1	
R.M.	12.E2		-9.E2		0.		-1.E1	
LAMB	2027.E2		-2030.E2		3015.E1		287.E1	
SUM	-2283514.E2	2	1708109.E2	2	3015.E1	4	160929.E1	1
Pd	Z = 46		M = 105.880		RMS = 4.526(50)		R = 5.843(65)	
COUL	-2391421.E2		1789165.E2		0.		175982.E1	
R.M.	12.E2		-9.E2		0.		-1.E1	
LAMB	2184.E2		-2186.E2		3255.E1		312.E1	
SUM	-2389224.E2	3	1786970.E2	3	3255.E1	5	176292.E1	1
Ag	Z = 47		M = 106.880		RMS = 4.542(2)		R = 5.864(3)	
COUL	-2499914.E2		1870124.E2		0.		192438.E1	
R.M.	12.E2		-9.E2		0.		-1.E1	
LAMB	2350.E2		-2351.E2		3509.E1		337.E1	
SUM	-2497552.E2	2	1867763.E2	3	3509.E1	4	192774.E1	1
Cd	Z = 48		M = 113.880		RMS = 4.613(2)		R = 5.955(3)	
COUL	-2611056.E2		1953039.E2		0.		210071.E1	
R.M.	12.E2		-9.E2		0.		-1.E1	
LAMB	2527.E2		-2528.E2		3782.E1		363.E1	
SUM	-2608517.E2	3	1950502.E2	3	3782.E1	4	210433.E1	2

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}-1s_{1/2}$		$2s_{1/2}-2p_{1/2}$		$2p_{3/2}-2p_{1/2}$	
In	Z = 49		M = 114.880		RMS = 4.619(15)		R = 5.963(19)	
COUL	-2724869.E2		2037927.E2		0.		228941.E1	
R.M.	13.E2		-9.E2		0.		-1.E1	
LAMB	2710.E2		-2711.E2		4065.E1		391.E1	
SUM	-2722146.E2	3	2035206.E2	3	4065.E1	5	229331.E1	2
Sn	Z = 50		M = 119.870		RMS = 4.655(1)		R = 6.010(1)	
COUL	-2841376.E2		2124803.E2		0.		249114.E1	
R.M.	13.E2		-9.E2		0.		-1.E1	
LAMB	2905.E2		-2905.E2		4367.E1		420.E1	
SUM	-2838458.E2	3	2121888.E2	3	4367.E1	5	249532.E1	2
Sb	Z = 51		M = 120.880		RMS = 4.704(50)		R = 6.073(65)	
COUL	-2960603.E2		2213684.E2		0.		270654.E1	
R.M.	13.E2		-10.E2		0.		-1.E1	
LAMB	3112.E2		-3111.E2		4687.E1		450.E1	
SUM	-2957478.E2	5	2210563.E2	5	4687.E1	8	271103.E1	2
Te	Z = 52		M = 129.880		RMS = 4.804(50)		R = 6.202(65)	
COUL	-3082574.E2		2304588.E2		0.		293631.E1	
R.M.	13.E2		-9.E2		0.		-1.E1	
LAMB	3334.E2		-3332.E2		5031.E1		481.E1	
SUM	-3079228.E2	5	2301247.E2	5	5031.E1	9	294111.E1	2
I	Z = 53		M = 126.880		RMS = 4.752(11)		R = 6.135(14)	
COUL	-3207317.E2		2397533.E2		0.		318117.E1	
R.M.	13.E2		-10.E2		0.		-1.E1	
LAMB	3555.E2		-3552.E2		5376.E1		514.E1	
SUM	-3203748.E2	4	2393971.E2	4	5376.E1	7	318630.E1	2
Xe	Z = 54		M = 131.870		RMS = 4.826(50)		R = 6.230(65)	
COUL	-3334859.E2		2492536.E2		0.		344187.E1	
R.M.	13.E2		-10.E2		0.		-1.E1	
LAMB	3799.E2		-3795.E2		5757.E1		548.E1	
SUM	-3331046.E2	6	2488732.E2	7	5757.E1	10	344733.E1	2
Cs	Z = 55		M = 132.880		RMS = 4.807(1)		R = 6.206(1)	
COUL	-3465227.E2		2589619.E2		0.		371917.E1	
R.M.	14.E2		-10.E2		0.		-2.E1	
LAMB	4047.E2		-4041.E2		6145.E1		583.E1	
SUM	-3461166.E2	4	2585568.E2	5	6145.E1	7	372499.E1	3
Ba	Z = 56		M = 137.870		RMS = 4.840(1)		R = 6.248(1)	
COUL	-3598452.E2		2688801.E2		0.		401388.E1	
R.M.	14.E2		-10.E2		0.		-2.E1	
LAMB	4313.E2		-4305.E2		6561.E1		619.E1	
SUM	-3594125.E2	5	2684486.E2	5	6561.E1	8	402006.E1	3

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leqslant Z \leqslant 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
La	Z = 57		M = 138.880		RMS = 4.855(1)		R = 6.268(1)	
COUL	-3734564.E2		2790101.E2		0.		432684.E1	
R.M.	14.E2		-10.E2		0.		-2.E1	
LAMB	4591.E2		-4580.E2		6997.E1		656.E1	
SUM	-3729959.E2	5	2785511.E2	5	6997.E1	9	433339.E1	3
Ce	Z = 58		M = 139.870		RMS = 4.877(1)		R = 6.296(1)	
COUL	-3873594.E2		2893543.E2		0.		465892.E1	
R.M.	15.E2		-11.E2		0.		-2.E1	
LAMB	4883.E2		-4870.E2		7458.E1		694.E1	
SUM	-3868696.E2	5	2888662.E2	6	7458.E1	9	466585.E1	3
Pr	Z = 59		M = 140.880		RMS = 4.893(1)		R = 6.317(1)	
COUL	-4015575.E2		2999148.E2		0.		501102.E1	
R.M.	15.E2		-11.E2		0.		-2.E1	
LAMB	5190.E2		-5174.E2		7942.E1		733.E1	
SUM	-4010370.E2	6	2993963.E2	6	7942.E1	10	501833.E1	3
Nd	Z = 60		M = 141.870		RMS = 4.915(1)		R = 6.345(1)	
COUL	-4160542.E2		3106939.E2		0.		538408.E1	
R.M.	15.E2		-11.E2		0.		-2.E1	
LAMB	5514.E2		-5495.E2		8454.E1		773.E1	
SUM	-4155012.E2	6	3101433.E2	6	8454.E1	11	539179.E1	4
Pm	Z = 61		M = 145.880		RMS = 4.962(50)		R = 6.406(65)	
COUL	-4308529.E2		3216941.E2		0.		577909.E1	
R.M.	15.E2		-11.E2		0.		-2.E1	
LAMB	5860.E2		-5837.E2		9000.E1		812.E1	
SUM	-4302653.E2	12	3211093.E2	12	9000.E1	20	578719.E1	4
Sm	Z = 62		M = 151.890		RMS = 5.031(63)		R = 6.495(81)	
COUL	-4459572.E2		3329177.E2		0.		619705.E1	
R.M.	15.E2		-11.E2		0.		-2.E1	
LAMB	6229.E2		-6202.E2		9584.E1		852.E1	
SUM	-4453328.E2	16	3322964.E2	16	9584.E1	27	620555.E1	4
Eu	Z = 63		M = 152.890		RMS = 5.041(50)		R = 6.508(65)	
COUL	-4613710.E2		3443675.E2		0.		663903.E1	
R.M.	16.E2		-12.E2		0.		-2.E1	
LAMB	6605.E2		-6573.E2		1018.E2		892.E1	
SUM	-4607090.E2	15	3437090.E2	15	1018.E2	2	664793.E1	5
Gd	Z = 64		M = 157.900		RMS = 5.089(50)		R = 6.570(65)	
COUL	-4770982.E2		3560459.E2		0.		710613.E1	
R.M.	16.E2		-12.E2		0.		-2.E1	
LAMB	7010.E2		-6973.E2		1082.E2		931.E1	
SUM	-4763956.E2	16	3553475.E2	17	1082.E2	3	711542.E1	5

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}-1s_{1/2}$		$2s_{1/2}-2p_{1/2}$		$2p_{3/2}-2p_{1/2}$	
Tb	Z = 65		M = 158.890		RMS = 5.099(50)		R = 6.583(65)	
COUL	-4931429.E2		3679559.E2		0.		759950.E1	
R.M.	16.E2		-12.E2		0.		-3.E1	
LAMB	7427.E2		-7384.E2		1149.E2		972.E1	
SUM	-4923986.E2	18	3672163.E2	18	1149.E2	3	760919.E1	5
Dy	Z = 66		M = 163.890		RMS = 5.083(81)		R = 6.562(105)	
COUL	-5095092.E2		3801003.E2		0.		812034.E1	
R.M.	16.E2		-12.E2		0.		-3.E1	
LAMB	7856.E2		-7808.E2		1218.E2		1011.E1	
SUM	-5087220.E2	29	3793183.E2	29	1218.E2	5	813042.E1	6
Ho	Z = 67		M = 164.890		RMS = 5.210(71)		R = 6.726(92)	
COUL	-5262016.E2		3924820.E2		0.		866988.E1	
R.M.	17.E2		-12.E2		0.		-3.E1	
LAMB	8360.E2		-8304.E2		1298.E2		1046.E1	
SUM	-5253640.E2	29	3916504.E2	29	1298.E2	5	868032.E1	7
Er	Z = 68		M = 165.890		RMS = 5.123(74)		R = 6.614(96)	
COUL	-5432247.E2		4051042.E2		0.		924944.E1	
R.M.	17.E2		-12.E2		0.		-3.E1	
LAMB	8810.E2		-8746.E2		1370.E2		1085.E1	
SUM	-5423421.E2	32	4042283.E2	33	1370.E2	5	926026.E1	7
Tm	Z = 69		M = 168.900		RMS = 5.192(50)		R = 6.703(65)	
COUL	-5605832.E2		4179700.E2		0.		986036.E1	
R.M.	17.E2		-13.E2		0.		-3.E1	
LAMB	9348.E2		-9276.E2		1456.E2		1119.E1	
SUM	-5596467.E2	26	4170412.E2	26	1456.E2	4	987151.E1	7
Yb	Z = 70		M = 173.900		RMS = 5.237(50)		R = 6.761(65)	
COUL	-5782820.E2		4310829.E2		0.		1050405.E1	
R.M.	17.E2		-13.E2		0.		-3.E1	
LAMB	9907.E2		-9825.E2		1546.E2		1149.E1	
SUM	-5772896.E2	28	4300991.E2	29	1546.E2	5	1051551.E1	8
Lu	Z = 71		M = 174.900		RMS = 5.246(50)		R = 6.773(65)	
COUL	-596326.E3		444446.E3		0.		1118200.E1	
R.M.	2.E3		-1.E3		0.		-4.E1	
LAMB	1048.E3		-1039.E3		1639.E2		1178.E1	
SUM	-595276.E3	3	443406.E3	3	1639.E2	5	1119375.E1	8
Hf	Z = 72		M = 179.910		RMS = 5.290(50)		R = 6.829(65)	
COUL	-614721.E3		458064.E3		0.		1189574.E1	
R.M.	2.E3		-1.E3		0.		-4.E1	
LAMB	1111.E3		-1100.E3		1739.E2		1202.E1	
SUM	-613609.E3	3	456962.E3	3	1739.E2	6	1190772.E1	9

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Ta	Z = 73		M = 180.910		RMS = 5.299(50)		R = 6.841(65)	
COUL	-633473.E3		471939.E3		0.		126469.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1175.E3		-1163.E3		1843.E2		122.E2	
SUM	-632296.E3	4	470775.E3	4	1843.E2	7	126591.E2	1
W	Z = 74		M = 183.910		RMS = 5.359(61)		R = 6.918(79)	
COUL	-652586.E3		486076.E3		0.		134371.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1246.E3		-1233.E3		1959.E2		123.E2	
SUM	-651338.E3	5	484842.E3	5	1959.E2	9	134494.E2	1
Re	Z = 75		M = 186.910		RMS = 5.351(50)		R = 6.908(65)	
COUL	-672068.E3		500479.E3		0.		142681.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1317.E3		-1302.E3		2074.E2		124.E2	
SUM	-670749.E3	5	499175.E3	5	2074.E2	8	142805.E2	1
Os	Z = 76		M = 189.920		RMS = 5.376(50)		R = 6.940(65)	
COUL	-691924.E3		515152.E3		0.		151418.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1394.E3		-1378.E3		2200.E2		124.E2	
SUM	-690527.E3	5	513772.E3	5	2200.E2	9	151542.E2	1
Ir	Z = 77		M = 192.920		RMS = 5.401(50)		R = 6.973(65)	
COUL	-712160.E3		530099.E3		0.		160601.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1477.E3		-1458.E3		2335.E2		123.E2	
SUM	-710682.E3	5	528639.E3	6	2335.E2	10	160724.E2	1
Pt	Z = 78		M = 194.920		RMS = 5.418(50)		R = 6.995(65)	
COUL	-732785.E3		545326.E3		0.		170250.E2	
R.M.	2.E3		-1.E3		0.		0.	
LAMB	1564.E3		-1543.E3		2477.E2		121.E2	
SUM	-731220.E3	6	543781.E3	6	2477.E2	11	170371.E2	1
Au	Z = 79		M = 196.920		RMS = 5.437(11)		R = 7.019(14)	
COUL	-753805.E3		560836.E3		0.		180386.E2	
R.M.	2.E3		-1.E3		0.		-1.E2	
LAMB	1656.E3		-1633.E3		2629.E2		118.E2	
SUM	-752147.E3	3	559201.E3	3	2629.E2	6	180504.E2	1
Hg	Z = 80		M = 201.930		RMS = 5.475(50)		R = 7.068(65)	
COUL	-775227.E3		576635.E3		0.		191031.E2	
R.M.	2.E3		-1.E3		0.		-1.E2	
LAMB	1757.E3		-1732.E3		2795.E2		113.E2	
SUM	-773467.E3	7	574902.E3	7	2795.E2	13	191144.E2	2

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Tl	Z = 81		M = 204.930		RMS = 5.483(1)		R = 7.079(1)	
COUL	-797059.E3		592729.E3		0.		202209.E2	
R.M.	2.E3		-1.E3		0.		-1.E2	
LAMB	1861.E3		-1833.E3		2967.E2		107.E2	
SUM	-795195.E3	3	590894.E3	3	2967.E2	6	202316.E2	1
Pb	Z = 82		M = 207.930		RMS = 5.505(1)		R = 7.107(1)	
COUL	-819309.E3		609122.E3		0.		2139431.E1	
R.M.	2.E3		-1.E3		0.		-6.E1	
LAMB	1974.E3		-1943.E3		3154.E2		991.E1	
SUM	-817333.E3	3	607178.E3	4	3154.E2	7	2140417.E1	16
Bi	Z = 83		M = 208.930		RMS = 5.531(5)		R = 7.140(6)	
COUL	-841986.E3		625821.E3		0.		2262595.E1	
R.M.	2.E3		-1.E3		0.		-6.E1	
LAMB	2096.E3		-2061.E3		3356.E2		886.E1	
SUM	-839888.E3	4	623758.E3	4	3356.E2	8	2263475.E1	18
Po	Z = 84		M = 210.000		RMS = 5.539(50)		R = 7.151(65)	
COUL	-865098.E3		642831.E3		0.		2391850.E1	
R.M.	2.E3		-1.E3		0.		-6.E1	
LAMB	2222.E3		-2184.E3		3567.E2		760.E1	
SUM	-862874.E3	10	640645.E3	11	3567.E2	20	2392604.E1	27
At	Z = 85		M = 215.000		RMS = 5.578(50)		R = 7.201(65)	
COUL	-888656.E3		660158.E3		0.		2527477.E1	
R.M.	2.E3		-2.E3		0.		-6.E1	
LAMB	2364.E3		-2322.E3		3805.E2		596.E1	
SUM	-886290.E3	11	657835.E3	12	3805.E2	22	2528066.E1	30
Rn	Z = 86		M = 222.000		RMS = 5.632(50)		R = 7.271(65)	
COUL	-912669.E3		677810.E3		0.		2669775.E1	
R.M.	2.E3		-1.E3		0.		-7.E1	
LAMB	2521.E3		-2473.E3		4067.E2		391.E1	
SUM	-910146.E3	13	675335.E3	13	4067.E2	25	2670159.E1	33
Fr	Z = 87		M = 223.000		RMS = 5.640(50)		R = 7.281(65)	
COUL	-937146.E3		695793.E3		0.		2819056.E1	
R.M.	2.E3		-2.E3		0.		-7.E1	
LAMB	2678.E3		-2626.E3		4333.E2		162.E1	
SUM	-934466.E3	14	693166.E3	14	4333.E2	27	2819211.E1	36
Ra	Z = 88		M = 226.000		RMS = 5.663(50)		R = 7.311(65)	
COUL	-962100.E3		714114.E3		0.		2975651.E1	
R.M.	2.E3		-2.E3		0.		-7.E1	
LAMB	2852.E3		-2793.E3		4627.E2		-115.E1	
SUM	-959246.E3	15	711319.E3	15	4627.E2	31	2975529.E1	41

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
Ac	Z = 89		M = 227.000		RMS = 5.670(50)		R = 7.320(65)	
COUL	-987541.E3		732782.E3		0.		3139908.E1	
R.M.	2.E3		-2.E3		0.		-8.E1	
LAMB	3035.E3		-2970.E3		4938.E2		-437.E1	
SUM	-984504.E3	16	729811.E3	17	4938.E2	34	3139464.E1	46
Th	Z = 90		M = 231.000		RMS = 5.707(50)		R = 7.368(65)	
COUL	-1013481.E3		751803.E3		0.		3312196.E1	
R.M.	2.E3		-2.E3		0.		-8.E1	
LAMB	3241.E3		-3169.E3		5290.E2		-834.E1	
SUM	-1010237.E3	18	748633.E3	19	5290.E2	38	3311354.E1	52
Pa	Z = 91		M = 231.000		RMS = 5.700(50)		R = 7.359(65)	
COUL	-1039933.E3		771188.E3		0.		349290.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	3450.E3		-3370.E3		5648.E2		-127.E2	
SUM	-1036480.E3	20	767816.E3	20	5648.E2	42	349163.E2	6
U	Z = 92		M = 238.000		RMS = 5.751(50)		R = 7.425(65)	
COUL	-1066910.E3		790943.E3		0.		368244.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	3698.E3		-3608.E3		6073.E2		-183.E2	
SUM	-1063210.E3	22	787333.E3	22	6073.E2	46	368061.E2	7
Np	Z = 93		M = 237.000		RMS = 5.744(50)		R = 7.415(65)	
COUL	-1094426.E3		811080.E3		0.		388125.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	3943.E3		-3844.E3		6498.E2		-243.E2	
SUM	-1090481.E3	24	807234.E3	24	6498.E2	51	387882.E2	7
Pu	Z = 94		M = 244.000		RMS = 5.794(50)		R = 7.480(65)	
COUL	-1122496.E3		831607.E3		0.		408979.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	4235.E3		-4125.E3		7005.E2		-319.E2	
SUM	-1118259.E3	26	827480.E3	27	7005.E2	57	408659.E2	8
Am	Z = 95		M = 243.000		RMS = 5.787(50)		R = 7.471(65)	
COUL	-1151136.E3		852535.E3		0.		430856.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	4526.E3		-4404.E3		7512.E2		-401.E2	
SUM	-1146608.E3	29	848130.E3	30	7512.E2	64	430454.E2	9
Cm	Z = 96		M = 247.000		RMS = 5.816(50)		R = 7.508(65)	
COUL	-1180363.E3		873876.E3		0.		453807.E2	
R.M.	2.E3		-2.E3		0.		-1.E2	
LAMB	4862.E3		-4725.E3		8100.E2		-501.E2	
SUM	-1175498.E3	32	869149.E3	32	8100.E2	71	453305.E2	11

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$	$2p_{1/2}$-$1s_{1/2}$	$2s_{1/2}$-$2p_{1/2}$	$2p_{3/2}$-$2p_{1/2}$
Bk	Z = 97	M = 247.000	RMS = 5.816(50)	R = 7.508(65)
COUL	-1210193.E3	895642.E3	0.	477889.E2
R.M.	2.E3	-2.E3	0.	-1.E2
LAMB	5212.E3	-5060.E3	8716.E2	-613.E2
SUM	-1204979.E3 35	890580.E3 36	8716.E2 79	477275.E2 12
Cf	Z = 98	M = 251.000	RMS = 5.844(50)	R = 7.545(65)
COUL	-1240647.E3	917844.E3	0.	503161.E2
R.M.	2.E3	-2.E3	0.	-1.E2
LAMB	5613.E3	-5442.E3	9424.E2	-748.E2
SUM	-1235031.E3 38	912400.E3 39	9424.E2 88	502412.E2 14
Es	Z = 99	M = 254.000	RMS = 5.865(50)	R = 7.572(65)
COUL	-1271743.E3	940496.E3	0.	529685.E2
R.M.	2.E3	-2.E3	0.	-1.E2
LAMB	6048.E3	-5857.E3	1020.E3	-904.E2
SUM	-1265693.E3 42	934637.E3 43	1020.E3 10	528781.E2 15
Fm	Z = 100	M = 257.000	RMS = 5.886(50)	R = 7.599(65)
COUL	-1303503.E3	963612.E3	0.	55753.E3
R.M.	2.E3	-2.E3	0.	0.
LAMB	6525.E3	-6312.E3	1105.E3	-108.E3
SUM	-1296975.E3 46	957299.E3 47	1105.E3 11	55645.E3 2
Md	Z = 101	M = 258.000	RMS = 5.893(50)	R = 7.608(65)
COUL	-1335950.E3	987208.E3	0.	58677.E3
R.M.	3.E3	-2.E3	0.	0.
LAMB	7039.E3	-6799.E3	1197.E3	-129.E3
SUM	-1328909.E3 50	980407.E3 52	1197.E3 12	58548.E3 2
No	Z = 102	M = 257.000	RMS = 5.886(50)	R = 7.599(65)
COUL	-1369108.E3	1011299.E3	0.	61748.E3
R.M.	3.E3	-2.E3	0.	0.
LAMB	7589.E3	-7321.E3	1296.E3	-153.E3
SUM	-1361516.E3 55	1003976.E3 57	1296.E3 14	61595.E3 2
Lr	Z = 103	M = 260.000	RMS = 5.906(50)	R = 7.625(65)
COUL	-1403003.E3	1035903.E3	0.	64975.E3
R.M.	3.E3	-2.E3	0.	0.
LAMB	8224.E3	-7922.E3	1411.E3	-181.E3
SUM	-1394776.E3 60	1027979.E3 63	1411.E3 15	64794.E3 3
	Z = 104	M = 255.000	RMS = 5.872(50)	R = 7.581(65)
COUL	-1437663.E3	1061039.E3	0.	68366.E3
R.M.	3.E3	-2.E3	0.	0.
LAMB	8863.E3	-8524.E3	1527.E3	-212.E3
SUM	-1428797.E3 66	1052513.E3 69	1527.E3 17	68154.E3 3

TABLE I. Binding Energies of $1s_{1/2}$ Electrons and Energy-Level Separations among $n = 1$ and $n = 2$ Levels in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

	$1s_{1/2}$		$2p_{1/2}$-$1s_{1/2}$		$2s_{1/2}$-$2p_{1/2}$		$2p_{3/2}$-$2p_{1/2}$	
	Z = 105		M = 262.000		RMS = 5.920(50)		R = 7.643(65)	
COUL	-1473118.E3		1086726.E3		0.		71932.E3	
R.M.	3.E3		-2.E3		0.		0.	
LAMB	9671.E3		-9287.E3		1674.E3		-251.E3	
SUM	-1463444.E3	73	1077437.E3	76	1674.E3	19	71680.E3	3
	Z = 106		M = 263.000		RMS = 5.927(50)		R = 7.652(65)	
COUL	-150940.E4		111299.E4		0.		75682.E3	
R.M.	0.		0.		0.		0.	
LAMB	1051.E4		-1008.E4		1827.E3		-295.E3	
SUM	-149889.E4	8	110291.E4	8	1827.E3	21	75387.E3	4
	Z = 107		M = 262.000		RMS = 5.920(50)		R = 7.643(65)	
COUL	-154655.E4		113984.E4		0.		79629.E3	
R.M.	0.		0.		0.		0.	
LAMB	1142.E4		-1093.E4		1995.E3		-346.E3	
SUM	-153512.E4	9	112891.E4	9	1995.E3	23	79283.E3	4
	Z = 108		M = 264.000		RMS = 5.934(50)		R = 7.661(65)	
COUL	-158459.E4		116732.E4		0.		83785.E3	
R.M.	0.		0.		0.		0.	
LAMB	1247.E4		-1192.E4		2188.E3		-406.E3	
SUM	-157211.E4	10	115540.E4	10	2188.E3	26	83378.E3	5
	Z = 109		M = 266.000		RMS = 5.947(50)		R = 7.678(65)	
COUL	-162358.E4		119545.E4		0.		88162.E3	
R.M.	0.		0.		0.		0.	
LAMB	1364.E4		-1301.E4		2403.E3		-477.E3	
SUM	-160993.E4	11	118244.E4	11	2403.E3	29	87685.E3	6
	Z = 110		M = 268.000		RMS = 5.961(50)		R = 7.696(65)	
COUL	-166355.E4		122425.E4		0.		92777.E3	
R.M.	0.		0.		0.		0.	
LAMB	1495.E4		-1422.E4		2645.E3		-560.E3	
SUM	-164860.E4	12	121003.E4	12	2645.E3	33	92216.E3	6

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 1	SELF	10.3168(1)	10.5468(1)	-0.1264	0.1235
	UEHL	-0.2644	-0.2644	0.	0.
	W.K.	0.	0.	0.	0.
	H.O.	0.0013	0.0013	0.0003	-0.0001
	F.S.	0.0013(1)	0.0013(1)	0.	0.
	R.R.	0.0030	0.0034	-0.0002	-0.0002
	R-RM	-0.0156(2)	-0.0160(2)	0.0001	-0.0002
	LAMB	10.0423(2)	10.2723(2)	-0.1262	0.1230
Z = 2	SELF	8.5283(2)	8.7587(2)	-0.1258	0.1238
	UEHL	-0.2623	-0.2623	0.	0.
	W.K.	0.	0.	0.	0.
	H.O.	0.0013(1)	0.0013(1)	0.0003	-0.0001
	F.S.	0.0054(3)	0.0054(3)	0.	0.
	R.R.	0.0014(1)	0.0016(1)	-0.0001	-0.0001
	R-RM	-0.0032(1)	-0.0033(1)	0.	0.
	LAMB	8.2709(4)	8.5014(4)	-0.1256	0.1235
Z = 3	SELF	7.5045(5)	7.7354(5)	-0.1249(1)	0.1243(1)
	UEHL	-0.2603	-0.2604	0.	0.
	W.K.	0.	0.	0.	0.
	H.O.	0.0013(1)	0.0013(1)	0.0003	-0.0001
	F.S.	0.0111(3)	0.0111(3)	0.	0.
	R.R.	0.0011(1)	0.0013(1)	-0.0001	-0.0001
	R-RM	-0.0016(1)	-0.0016(1)	0.	0.
	LAMB	7.2561(6)	7.4870(6)	-0.1247(1)	0.1241(1)
Z = 4	SELF	6.7928(7)	7.0245(8)	-0.1239(1)	0.1249(1)
	UEHL	-0.2584	-0.2586	-0.0001	0.
	W.K.	0.	0.	0.	0.
	H.O.	0.0013(2)	0.0013(2)	0.0003	-0.0001
	F.S.	0.0123(1)	0.0123(1)	0.	0.
	R.R.	0.0011(2)	0.0013(2)	-0.0001	-0.0001
	R-RM	-0.0011(2)	-0.0011(2)	0.	0.
	LAMB	6.5480(8)	6.7797(9)	-0.1238(1)	0.1247(1)
Z = 5	SELF	6.2516(10)	6.4841(10)	-0.1226(2)	0.1256(2)
	UEHL	-0.2567	-0.2569	-0.0001	0.
	W.K.	0.0001	0.0001	0.	0.
	H.O.	0.0013(3)	0.0013(3)	0.0003(1)	-0.0001
	F.S.	0.0112(7)	0.0112(7)	0.	0.
	R.R.	0.0011(3)	0.0013(3)	-0.0001	-0.0001
	R-RM	-0.0008(2)	-0.0008(2)	0.	0.
	LAMB	6.0077(13)	6.2402(13)	-0.1225(2)	0.1254(2)
Z = 6	SELF	5.8178(12)	6.0514(13)	-0.1212(2)	0.1264(2)
	UEHL	-0.2550	-0.2554	-0.0001	0.
	W.K.	0.0001	0.0001	0.	0.
	H.O.	0.0013(5)	0.0013(5)	0.0003(1)	-0.0001
	F.S.	0.0118	0.0118	0.	0.
	R.R.	0.0012(4)	0.0014(5)	-0.0001	-0.0001
	R-RM	-0.0007(2)	-0.0007(2)	0.	0.
	LAMB	5.5764(14)	5.8099(15)	-0.1211(2)	0.1261(2)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 7	SELF	5.4579(15)	5.6927(15)	-0.1197(3)	0.1273(3)
	UEHL	-0.2535	-0.2540	-0.0002	0.
	W.K.	0.0001	0.0001	0.	0.
	H.O.	0.0013(6)	0.0013(6)	0.0003(1)	-0.0001(1)
	F.S.	0.0128(1)	0.0128(1)	0.	0.
	R.R.	0.0011(6)	0.0013(7)	-0.0001	-0.0001
	R-RM	-0.0005(3)	-0.0005(3)	0.	0.
	LAMB	5.2192(17)	5.4537(18)	-0.1197(3)	0.1270(3)
Z = 8	SELF	5.1519(17)	5.3879(17)	-0.1181(3)	0.1282(3)
	UEHL	-0.2521	-0.2527	-0.0002	0.
	W.K.	0.0002	0.0002	0.	0.
	H.O.	0.0013(8)	0.0013(8)	0.0003(2)	-0.0001(1)
	F.S.	0.0145(1)	0.0146(2)	0.	0.
	R.R.	0.0011(7)	0.0013(8)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0004(3)	-0.0004(3)	0.	0.
	LAMB	4.9165(20)	5.1521(21)	-0.1181(3)	0.1279(3)
Z = 9	SELF	4.8869(18)	5.1243(19)	-0.1163(4)	0.1292(4)
	UEHL	-0.2507	-0.2515	-0.0003	-0.0001
	W.K.	0.0002	0.0002	0.	0.
	H.O.	0.0013(10)	0.0013(10)	0.0003(2)	-0.0001(1)
	F.S.	0.0168(2)	0.0168(2)	0.	0.
	R.R.	0.0010(8)	0.0012(10)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0003(3)	-0.0003(3)	0.	0.
	LAMB	4.6551(23)	4.8920(24)	-0.1164(5)	0.1289(4)
Z = 10	SELF	4.6540(20)	4.8930(20)	-0.1145(4)	0.1303(4)
	UEHL	-0.2494	-0.2504	-0.0003	-0.0001
	W.K.	0.0003	0.0003	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0183(2)	0.0184(2)	0.	0.
	R.R.	0.0011(11)	0.0013(13)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0003(3)	-0.0003(3)	0.	0.
	LAMB	4.4252(26)	4.6635(27)	-0.1146(5)	0.1300(4)
Z = 11	SELF	4.4470(19)	4.6878(18)	-0.1126(4)	0.1314(4)
	UEHL	-0.2483	-0.2494	-0.0004	-0.0001
	W.K.	0.0003	0.0003	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0178(3)	0.0179(3)	0.	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0002(2)	-0.0002(2)	0.	0.
	LAMB	4.2188(25)	4.4588(25)	-0.1128(5)	0.1311(4)
Z = 12	SELF	4.2614(18)	4.5040(16)	-0.1106(4)	0.1326(4)
	UEHL	-0.2472	-0.2485	-0.0005	-0.0001
	W.K.	0.0004	0.0004	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0190(4)	0.0192(4)	0.	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0002(2)	-0.0002(2)	0.	0.
	LAMB	4.0357(25)	4.2773(24)	-0.1109(5)	0.1323(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 13	SELF	4.0936(16)	4.3381(14)	-0.1085(4)	0.1338(4)
	S-FS	0.	0.	0.	0.
	UEHL	-0.2461	-0.2477	-0.0006	-0.0001
	W.K.	0.0004	0.0004	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0191(2)	0.0192(2)	0.	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0002(2)	-0.0002(2)	0.	0.
	LAMB	3.8690(23)	4.1123(22)	-0.1089(5)	0.1335(4)
Z = 14	SELF	3.9409(15)	4.1874(12)	-0.1064(4)	0.1351(4)
	S-FS	0.	0.	0.	0.
	UEHL	-0.2452	-0.2470	-0.0007	-0.0001
	W.K.	0.0005	0.0005	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0201(3)	0.0203(3)	0.	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0002(2)	0.	0.
	LAMB	3.7184(22)	3.9634(21)	-0.1068(5)	0.1348(4)
Z = 15	SELF	3.8011(14)	4.0498(10)	-0.1042(4)	0.1364(4)
	S-FS	0.	0.	0.	0.
	UEHL	-0.2443	-0.2464	-0.0008	-0.0001
	W.K.	0.0006	0.0006	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0215(1)	0.0217(1)	0.	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.5809(21)	3.8279(20)	-0.1047(5)	0.1360(4)
Z = 16	SELF	3.6726(13)	3.9235(9)	-0.1019(4)	0.1378(4)
	S-FS	0.	0.	0.	0.
	UEHL	-0.2435	-0.2459	-0.0009	-0.0002
	W.K.	0.0006	0.0006	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0224(1)	0.0227(1)	0.0001	0.
	R.R.	0.0010(10)	0.0012(12)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.4543(21)	3.7033(20)	-0.1025(5)	0.1374(4)
Z = 17	SELF	3.5539(12)	3.8070(7)	-0.0996(4)	0.1392(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2428	-0.2454	-0.0010	-0.0002
	W.K.	0.0007	0.0007	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0239(3)	0.0243(3)	0.0001	0.
	R.R.	0.0009(9)	0.0011(11)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.3379(20)	3.5888(19)	-0.1003(5)	0.1388(4)
Z = 18	SELF	3.4439(12)	3.6993(6)	-0.0972(4)	0.1406(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2421	-0.2451	-0.0011	-0.0002
	W.K.	0.0008	0.0008	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0256(1)	0.0260(1)	0.0001	0.
	R.R.	0.0009(9)	0.0010(10)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.2302(19)	3.4832(17)	-0.0980(5)	0.1402(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 19	SELF	3.3415(11)	3.5994(5)	-0.0947(4)	0.1421(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2415	-0.2448	-0.0012	-0.0002
	U-FS	0.	0.	0.	0.
	W.K.	0.0009	0.0009	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0256(4)	0.0261(4)	0.0001	0.
	R.R.	0.0009(9)	0.0011(11)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.1286(19)	3.3838(18)	-0.0957(5)	0.1417(4)
Z = 20	SELF	3.2460(10)	3.5063(4)	-0.0922(4)	0.1436(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2409	-0.2446	-0.0014	-0.0003
	U-FS	0.	0.	0.	0.
	W.K.	0.0009	0.0009	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0270(1)	0.0275(1)	0.0001	0.
	R.R.	0.0009(9)	0.0011(11)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	3.0352(19)	3.2925(18)	-0.0933(5)	0.1431(4)
Z = 21	SELF	3.1567(9)	3.4194(3)	-0.0896(4)	0.1451(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2404	-0.2445	-0.0015	-0.0003
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0010	0.0010	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0285(8)	0.0291(8)	0.0001	0.
	R.R.	0.0009(9)	0.0011(11)	-0.0001(1)	-0.0001(1)
	R-RM	-0.0001(1)	-0.0001(1)	0.	0.
	LAMB	2.9478(19)	3.2072(19)	-0.0908(5)	0.1446(4)
Z = 22	SELF	3.0729(9)	3.3382(3)	-0.0870(4)	0.1467(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2400	-0.2444	-0.0017	-0.0003
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0011	0.0011	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0298(1)	0.0305(2)	0.0001	0.
	R.R.	0.0009(9)	0.0010(10)	-0.0001(1)	-0.0001(1)
	R-RM	0.	-0.0001(1)	0.	0.
	LAMB	2.8659(18)	3.1276(17)	-0.0883(5)	0.1462(4)
Z = 23	SELF	2.9941(8)	3.2620(3)	-0.0843(4)	0.1483(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2396	-0.2445	-0.0018	-0.0003
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0012	0.0012	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0303(4)	0.0311(4)	0.0002	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	R-RM	0.	0.	0.	0.
	LAMB	2.7880(18)	3.0520(17)	-0.0858(5)	0.1478(4)
Z = 24	SELF	2.9199(7)	3.1905(2)	-0.0816(4)	0.1500(4)
	S-FS	-0.0001(1)	-0.0001(1)	0.	0.
	UEHL	-0.2393	-0.2446	-0.0020	-0.0004
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0013	0.0013	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0310(10)	0.0319(11)	0.0002	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	R-RM	0.	0.	0.	0.
	LAMB	2.7149(20)	2.9813(20)	-0.0832(5)	0.1494(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 25	SELF	2.8499(7)	3.1231(3)	-0.0788(4)	0.1517(4)
	S-FS	-0.0001(1)	-0.0002(2)	0.	0.
	UEHL	-0.2391	-0.2448	-0.0022	-0.0004
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0014	0.0014	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0331(10)	0.0341(10)	0.0002	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.6474(19)	2.9160(19)	-0.0806(5)	0.1511(4)
Z = 26	SELF	2.7838(6)	3.0597(3)	-0.0760(4)	0.1534(4)
	S-FS	-0.0002(2)	-0.0002(2)	0.	0.
	UEHL	-0.2389	-0.2451	-0.0024	-0.0004
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0015	0.0015	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0343(1)	0.0354(1)	0.0002	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.5827(16)	2.8537(17)	-0.0779(5)	0.1528(4)
Z = 27	SELF	2.7212(6)	2.9998(3)	-0.0731(4)	0.1551(4)
	S-FS	-0.0002(2)	-0.0002(2)	0.	0.
	UEHL	-0.2388	-0.2454	-0.0026	-0.0004
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0016	0.0016	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0357(6)	0.0370(7)	0.0003	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.5218(17)	2.7951(18)	-0.0752(5)	0.1545(4)
Z = 28	SELF	2.6618(5)	2.9433(3)	-0.0701(4)	0.1568(4)
	S-FS	-0.0002(2)	-0.0002(2)	0.	0.
	UEHL	-0.2387	-0.2458	-0.0028	-0.0005
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0017	0.0018	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0363(4)	0.0377(4)	0.0003	0.
	R.R.	0.0009(9)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.4631(17)	2.7390(17)	-0.0724(5)	0.1561(4)
Z = 29	SELF	2.6055(5)	2.8898(3)	-0.0671(4)	0.1586(4)
	S-FS	-0.0002(2)	-0.0003(3)	0.	0.
	UEHL	-0.2387	-0.2464	-0.0030	-0.0005
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0018	0.0019	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0394(1)	0.0409(1)	0.0004	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.4100(16)	2.6884(17)	-0.0695(5)	0.1579(4)
Z = 30	SELF	2.5519(5)	2.8391(3)	-0.0641(4)	0.1604(4)
	S-FS	-0.0003(3)	-0.0003(3)	0.	0.
	UEHL	-0.2387	-0.2469	-0.0033	-0.0005
	U-FS	0.0001	0.0001	0.	0.
	W.K.	0.0020	0.0020	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0413(10)	0.0431(10)	0.0004	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.3584(19)	2.6393(19)	-0.0667(5)	0.1597(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 31	SELF	2.5009(5)	2.7911(3)	-0.0610(4)	0.1622(4)
	S-FS	-0.0003(3)	-0.0003(3)	0.	0.
	UEHL	-0.2388	-0.2476	-0.0035	-0.0006
	U-FS	0.0001	0.0002	0.	0.
	W.K.	0.0021	0.0021	0.	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0430(10)	0.0450(11)	0.0004	0.
	R.R.	0.0008(8)	0.0010(10)	-0.0001(1)	-0.0001(1)
	LAMB	2.3091(19)	2.5927(20)	-0.0638(5)	0.1614(4)
Z = 32	SELF	2.4524(5)	2.7456(3)	-0.0579(4)	0.1641(4)
	S-FS	-0.0003(3)	-0.0004(4)	0.	0.
	UEHL	-0.2389	-0.2483	-0.0038	-0.0006
	U-FS	0.0002	0.0002	0.	0.
	W.K.	0.0022	0.0023	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0457(11)	0.0479(11)	0.0005	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.2632(19)	2.5494(20)	-0.0609(5)	0.1633(4)
Z = 33	SELF	2.4061(5)	2.7024(3)	-0.0547(4)	0.1659(4)
	S-FS	-0.0004(4)	-0.0004(4)	0.	0.
	UEHL	-0.2391	-0.2492	-0.0040	-0.0006
	U-FS	0.0002	0.0002	0.	0.
	W.K.	0.0023	0.0024	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0472	0.0497	0.0006	0.
	R.R.	0.0008(8)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.2183(16)	2.5073(16)	-0.0579(5)	0.1651(4)
Z = 34	SELF	2.3620(5)	2.6614(3)	-0.0514(4)	0.1678(4)
	S-FS	-0.0004(4)	-0.0004(4)	0.	0.
	UEHL	-0.2394	-0.2501	-0.0043	-0.0007
	U-FS	0.0002	0.0002	0.	0.
	W.K.	0.0025(1)	0.0025(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0498(12)	0.0525(12)	0.0006	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.1766(20)	2.4683(20)	-0.0548(5)	0.1669(4)
Z = 35	SELF	2.3199(6)	2.6225(3)	-0.0481(4)	0.1697(4)
	S-FS	-0.0004(4)	-0.0005(5)	0.	0.
	UEHL	-0.2397	-0.2510	-0.0046	-0.0007
	U-FS	0.0002	0.0002	0.	0.
	W.K.	0.0026(1)	0.0027(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0505(12)	0.0535(12)	0.0007	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.1351(20)	2.4296(21)	-0.0518(5)	0.1688(4)
Z = 36	SELF	2.2796(6)	2.5855(3)	-0.0447(4)	0.1716(4)
	S-FS	-0.0005(5)	-0.0005(5)	0.	0.
	UEHL	-0.2401	-0.2521	-0.0049	-0.0007
	U-FS	0.0002	0.0002	0.	0.
	W.K.	0.0027(1)	0.0028(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0535(12)	0.0568(13)	0.0008	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.0975(20)	2.3949(21)	-0.0486(5)	0.1707(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 37	SELF	2.2410(6)	2.5504(3)	-0.0413(4)	0.1735(4)
	S-FS	-0.0005(5)	-0.0006(6)	0.	0.
	UEHL	-0.2405	-0.2533	-0.0053	-0.0008
	U-FS	0.0002	0.0003	0.	0.
	W.K.	0.0029(1)	0.0030(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0551(12)	0.0588(13)	0.0008	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.0602(21)	2.3607(21)	-0.0454(5)	0.1725(4)
Z = 38	SELF	2.2042(7)	2.5170(3)	-0.0379(4)	0.1755(4)
	S-FS	-0.0006(6)	-0.0006(6)	0.	0.
	UEHL	-0.2410	-0.2545	-0.0056	-0.0008
	U-FS	0.0003	0.0003	0.	0.
	W.K.	0.0030(1)	0.0031(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0563(9)	0.0603(10)	0.0009	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	2.0243(19)	2.3278(20)	-0.0423(5)	0.1745(4)
Z = 39	SELF	2.1689(7)	2.4852(3)	-0.0344(4)	0.1774(4)
	S-FS	-0.0006(6)	-0.0007(7)	0.	0.
	UEHL	-0.2415	-0.2558	-0.0059	-0.0009
	U-FS	0.0003	0.0003	0.	0.
	W.K.	0.0032(1)	0.0033(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0578(1)	0.0621(1)	0.0010	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.9900(17)	2.2966(17)	-0.0391(5)	0.1764(4)
Z = 40	SELF	2.1351(7)	2.4550(3)	-0.0308(4)	0.1794(4)
	S-FS	-0.0006(6)	-0.0007(7)	0.	0.
	UEHL	-0.2421	-0.2572	-0.0063	-0.0009
	U-FS	0.0003	0.0003	0.	0.
	W.K.	0.0033(1)	0.0034(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0600	0.0647	0.0011	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.9580(17)	2.2677(17)	-0.0357(5)	0.1783(4)
Z = 41	SELF	2.1027(7)	2.4262(3)	-0.0272(4)	0.1814(4)
	S-FS	-0.0007(7)	-0.0008(8)	0.	0.
	UEHL	-0.2427	-0.2587	-0.0067	-0.0009
	U-FS	0.0003	0.0004	0.	0.
	W.K.	0.0035(1)	0.0036(1)	0.0001	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0628(1)	0.0680(1)	0.0012	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.9278(18)	2.2408(18)	-0.0324(5)	0.1803(4)
Z = 42	SELF	2.0717(7)	2.3989(3)	-0.0235(4)	0.1834(4)
	S-FS	-0.0008(8)	-0.0009(9)	0.	0.
	UEHL	-0.2434	-0.2603	-0.0071	-0.0010
	U-FS	0.0004	0.0004	0.	0.
	W.K.	0.0036(1)	0.0038(1)	0.0002	0.
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0672(2)	0.0731(2)	0.0014	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.9007(18)	2.2171(18)	-0.0289(5)	0.1823(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 43	SELF	2.0419(8)	2.3729(3)	-0.0198(4)	0.1854(4)
	S-FS	-0.0008(8)	-0.0010(10)	0.	0.
	UEHL	-0.2442	-0.2619	-0.0076	-0.0010
	U-FS	0.0004	0.0004	0.	0.
	W.K.	0.0038(1)	0.0040(1)	0.0002	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0689(15)	0.0752(16)	0.0015	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.8719(24)	2.1917(25)	-0.0255(5)	0.1842(4)
Z = 44	SELF	2.0133(8)	2.3482(3)	-0.0160(4)	0.1874(4)
	S-FS	-0.0009(9)	-0.0011(11)	0.	0.
	UEHL	-0.2450	-0.2637	-0.0080	-0.0011
	U-FS	0.0004	0.0005	0.	0.
	W.K.	0.0039(1)	0.0041(2)	0.0002	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0728(15)	0.0798(17)	0.0016	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.8464(24)	2.1699(25)	-0.0220(5)	0.1862(4)
Z = 45	SELF	1.9859(8)	2.3247(2)	-0.0121(4)	0.1895(4)
	S-FS	-0.0010(8)	-0.0012(12)	0.	0.
	UEHL	-0.2459	-0.2656	-0.0085	-0.0011
	U-FS	0.0005	0.0005	0.	0.
	W.K.	0.0041(2)	0.0043(2)	0.0002	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0757(10)	0.0833(10)	0.0018	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.8212(21)	2.1482(22)	-0.0184(5)	0.1882(4)
Z = 46	SELF	1.9596(8)	2.3025(2)	-0.0082(3)	0.1916(4)
	S-FS	-0.0011(8)	-0.0013(12)	0.	0.
	UEHL	-0.2469	-0.2675	-0.0090	-0.0012
	U-FS	0.0005	0.0005	0.	0.
	W.K.	0.0043(2)	0.0045(2)	0.0002	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0786(16)	0.0869(18)	0.0020	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.7970(25)	2.1278(26)	-0.0148(4)	0.1903(4)
Z = 47	SELF	1.9343(8)	2.2813(2)	-0.0042(3)	0.1936(4)
	S-FS	-0.0012(8)	-0.0014(12)	0.	0.
	UEHL	-0.2479	-0.2696	-0.0095	-0.0012
	U-FS	0.0005(1)	0.0006(1)	0. (1)	0.
	W.K.	0.0045(2)	0.0047(2)	0.0002	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0814(1)	0.0904(1)	0.0021	0.
	R.R.	0.0007(7)	0.0009(9)	-0.0001(1)	-0.0001(1)
	LAMB	1.7736(19)	2.1082(19)	-0.0111(4)	0.1923(4)
Z = 48	SELF	1.9101(8)	2.2613(2)	-0.0001(3)	0.1957(4)
	S-FS	-0.0013(8)	-0.0015(12)	0.	0.
	UEHL	-0.2490	-0.2718	-0.0100	-0.0013
	U-FS	0.0006(1)	0.0007(1)	0. (1)	0.
	W.K.	0.0046(2)	0.0049(2)	0.0003	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0863(1)	0.0963(1)	0.0024	0.
	R.R.	0.0007(7)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.7533(18)	2.0920(19)	-0.0072(4)	0.1943(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 49	SELF	1.8868(8)	2.2423(2)	0.0040(3)	0.1978(4)
	S-FS	-0.0014(8)	-0.0016(12)	0.	0.
	UEHL	-0.2501	-0.2740	-0.0106	-0.0013
	U-FS	0.0006(1)	0.0007(1)	0. (1)	0.
	W.K.	0.0048(2)	0.0051(2)	0.0003	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0891(5)	0.0999(6)	0.0026	0.
	R.R.	0.0007(7)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.7318(19)	2.0745(20)	-0.0035(4)	0.1964(4)
Z = 50	SELF	1.8644(8)	2.2244(2)	0.0082(3)	0.1999(4)
	S-FS	-0.0015(8)	-0.0017(12)	0.	0.
	UEHL	-0.2513	-0.2764	-0.0112	-0.0013
	U-FS	0.0007(1)	0.0008(1)	0. (1)	0.
	W.K.	0.0050(2)	0.0054(3)	0.0003	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0932	0.1050	0.0028	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.7124(18)	2.0594(19)	0.0004(4)	0.1984(4)
Z = 51	SELF	1.8429(8)	2.2074(2)	0.0125(3)	0.2020(4)
	S-FS	-0.0016(8)	-0.0019(12)	0.	0.
	UEHL	-0.2526	-0.2789	-0.0118	-0.0014
	U-FS	0.0007(1)	0.0008(1)	0. (1)	0.
	W.K.	0.0052(3)	0.0056(3)	0.0003	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.0980(19)	0.1109(22)	0.0031(1)	0.
	R.R.	0.0007(7)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6945(27)	2.0460(29)	0.0044(4)	0.2005(4)
Z = 52	SELF	1.8222(7)	2.1914(2)	0.0168(3)	0.2041(4)
	S-FS	-0.0018(9)	-0.0021(12)	0.	0.
	UEHL	-0.2540	-0.2815	-0.0124	-0.0014
	U-FS	0.0008(1)	0.0009(1)	0. (1)	0.
	W.K.	0.0054(3)	0.0058(3)	0.0004	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1051(20)	0.1195(23)	0.0035(1)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6797(27)	2.0361(30)	0.0085(4)	0.2026(4)
Z = 53	SELF	1.8023(7)	2.1763(2)	0.0213(3)	0.2063(4)
	S-FS	-0.0018(8)	-0.0022(12)	0.	0.
	UEHL	-0.2554	-0.2843	-0.0131	-0.0015
	U-FS	0.0008(1)	0.0010(1)	0. (1)	0.
	W.K.	0.0056(3)	0.0061(3)	0.0004	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1063(5)	0.1216(5)	0.0037	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6598(19)	2.0205(20)	0.0126(4)	0.2047(4)
Z = 54	SELF	1.7832(7)	2.1622(2)	0.0258(3)	0.2084(4)
	S-FS	-0.0020(9)	-0.0024(13)	0.	0.
	UEHL	-0.2569	-0.2871	-0.0138	-0.0015
	U-FS	0.0009(1)	0.0011(1)	0. (1)	0.
	W.K.	0.0058(3)	0.0063(4)	0.0004	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1130(22)	0.1298(25)	0.0042(1)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6459(28)	2.0119(32)	0.0168(4)	0.2068(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 55	SELF	1.7649(6)	2.1489(3)	0.0304(3)	0.2106(4)
	S-FS	-0.0021(8)	-0.0026(12)	0.	0.
	UEHL	-0.2584	-0.2901	-0.0145	-0.0016
	U-FS	0.0010(1)	0.0011(1)	0. (1)	0.
	W.K.	0.0060(4)	0.0065(4)	0.0005	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1159	0.1339(1)	0.0045	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6292(18)	1.9999(20)	0.0210(4)	0.2089(4)
Z = 56	SELF	1.7473(6)	2.1364(3)	0.0351(3)	0.2127(4)
	S-FS	-0.0023(8)	-0.0028(13)	0.	0.
	UEHL	-0.2601	-0.2932	-0.0153	-0.0017
	U-FS	0.0011(1)	0.0012(1)	0. (1)	0.
	W.K.	0.0062(4)	0.0068(4)	0.0005	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1214	0.1410(1)	0.0049	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6155(18)	1.9915(20)	0.0254(4)	0.2110(4)
Z = 57	SELF	1.7304(5)	2.1248(3)	0.0399(3)	0.2149(4)
	S-FS	-0.0024(8)	-0.0030(13)	-0.0001	0.
	UEHL	-0.2618	-0.2965	-0.0161	-0.0017
	U-FS	0.0011(1)	0.0013(1)	0. (1)	0.
	W.K.	0.0064(4)	0.0071(5)	0.0006	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1263	0.1475(1)	0.0053	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.6019(18)	1.9833(20)	0.0299(4)	0.2131(4)
Z = 58	SELF	1.7142(5)	2.1140(3)	0.0448(3)	0.2171(4)
	S-FS	-0.0026(8)	-0.0032(13)	-0.0001	0.
	UEHL	-0.2636	-0.2999	-0.0170	-0.0018
	U-FS	0.0012(1)	0.0014(1)	0. (1)	0.
	W.K.	0.0067(4)	0.0073(5)	0.0006	0.0001
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1318	0.1548(1)	0.0058	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5896(18)	1.9765(20)	0.0344(4)	0.2153(4)
Z = 59	SELF	1.6987(4)	2.1040(4)	0.0498(3)	0.2193(4)
	S-FS	-0.0028(8)	-0.0035(13)	-0.0001	0.
	UEHL	-0.2655	-0.3034	-0.0178	-0.0018
	U-FS	0.0013(1)	0.0016(1)	0.0001(1)	0.
	W.K.	0.0069(5)	0.0076(5)	0.0007	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1373(1)	0.1622(1)	0.0063	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5779(18)	1.9706(21)	0.0391(4)	0.2174(4)
Z = 60	SELF	1.6838(4)	2.0948(4)	0.0549(3)	0.2215(4)
	S-FS	-0.0030(8)	-0.0037(13)	-0.0001	0.
	UEHL	-0.2675	-0.3071	-0.0188	-0.0019
	U-FS	0.0014(1)	0.0017(1)	0.0001(1)	0.
	W.K.	0.0071(5)	0.0079(6)	0.0007(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1435(1)	0.1705(1)	0.0069	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5673(18)	1.9661(21)	0.0439(4)	0.2196(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 61	SELF	1.6696(4)	2.0864(4)	0.0601(3)	0.2237(4)
	S-FS	-0.0032(9)	-0.0040(13)	-0.0001	0.
	UEHL	-0.2695	-0.3110	-0.0198	-0.0019
	U-FS	0.0015(1)	0.0018(1)	0.0001(1)	0.
	W.K.	0.0074(5)	0.0082(6)	0.0008(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1513(27)	0.1809(33)	0.0076(1)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5590(33)	1.9643(39)	0.0489(4)	0.2217(4)
Z = 62	SELF	1.6559(4)	2.0787(5)	0.0654(3)	0.2259(4)
	S-FS	-0.0035(9)	-0.0044(14)	-0.0001	0.
	UEHL	-0.2717	-0.3150	-0.0208	-0.0020
	U-FS	0.0017(1)	0.0020(1)	0.0001(1)	0.
	W.K.	0.0076(6)	0.0085(7)	0.0008(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1609(36)	0.1935(43)	0.0084(2)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5528(40)	1.9653(48)	0.0540(5)	0.2239(4)
Z = 63	SELF	1.6429(4)	2.0717(5)	0.0709(3)	0.2282(4)
	S-FS	-0.0037(9)	-0.0047(14)	-0.0002	0.
	UEHL	-0.2739	-0.3192	-0.0219	-0.0021
	U-FS	0.0018(1)	0.0022(1)	0.0001(1)	0.
	W.K.	0.0079(6)	0.0089(7)	0.0009(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1676(30)	0.2028(36)	0.0092(2)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5444(35)	1.9636(42)	0.0592(4)	0.2261(4)
Z = 64	SELF	1.6305(4)	2.0655(6)	0.0765(3)	0.2304(4)
	S-FS	-0.0040(9)	-0.0051(14)	-0.0002	0.
	UEHL	-0.2763	-0.3236	-0.0230	-0.0021
	U-FS	0.0019(1)	0.0024(1)	0.0001(1)	0.
	W.K.	0.0081(7)	0.0092(8)	0.0009(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1770(31)	0.2155(37)	0.0101(2)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5391(36)	1.9659(44)	0.0647(5)	0.2283(4)
Z = 65	SELF	1.6186(4)	2.0601(6)	0.0822(3)	0.2327(4)
	S-FS	-0.0043(9)	-0.0055(15)	-0.0002	0.
	UEHL	-0.2787	-0.3282	-0.0242	-0.0022
	U-FS	0.0021(1)	0.0026(1)	0.0001(1)	0.
	W.K.	0.0084(7)	0.0095(8)	0.0010(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1846(32)	0.2262(39)	0.0110(2)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5325(37)	1.9667(45)	0.0701(5)	0.2305(4)
Z = 66	SELF	1.6073(4)	2.0553(7)	0.0880(3)	0.2349(4)
	S-FS	-0.0045(9)	-0.0058(15)	-0.0002	0.
	UEHL	-0.2813	-0.3329	-0.0254	-0.0022
	U-FS	0.0022(1)	0.0027(1)	0.0001(1)	0.
	W.K.	0.0087(8)	0.0099(9)	0.0011(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.1909(53)	0.2354(66)	0.0119(3)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5251(56)	1.9666(70)	0.0756(5)	0.2327(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 67	SELF	1.5966(4)	2.0513(7)	0.0940(3)	0.2372(4)
	S-FS	-0.0050(9)	-0.0065(15)	-0.0003	0.
	UEHL	-0.2839	-0.3379	-0.0267	-0.0 23
	U-FS	0.0025(1)	0.0031(1)	0.0001(1)	0.
	W.K.	0.0090(8)	0.0102(9)	0.0012(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2073(49)	0.2573(61)	0.0134(3)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5282(53)	1.9796(66)	0.0819(5)	0.2349(4)
Z = 68	SELF	1.5863(4)	2.0480(8)	0.1002(3)	0.2394(4)
	S-FS	-0.0052(9)	-0.0067(15)	-0.0003	0.
	UEHL	-0.2867	-0.3431	-0.0281	-0.0024
	U-FS	0.0026(1)	0.0032(1)	0.0002(1)	0.
	W.K.	0.0093(9)	0.0106(10)	0.0013(1)	0.0002
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2096(53)	0.2620(66)	0.0142(4)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5177(56)	1.9760(70)	0.0875(6)	0.2371(4)
Z = 69	SELF	1.5767(4)	2.0454(8)	0.1064(3)	0.2417(4)
	S-FS	-0.0056(9)	-0.0073(16)	-0.0004	0.
	UEHL	-0.2896	-0.3485	-0.0296	-0.0024
	U-FS	0.0028(1)	0.0035(1)	0.0002(1)	0.
	W.K.	0.0095(9)	0.0110(11)	0.0014(1)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2234(37)	0.2811(47)	0.0157(3)	0.
	R.R.	0.0006(6)	0.0008(8)	-0.0001(1)	-0.0001(1)
	LAMB	1.5191(42)	1.9873(53)	0.0939(5)	0.2393(4)
Z = 70	SELF	1.5675(4)	2.0435(8)	0.1129(3)	0.2440(4)
	S-FS	-0.0061(10)	-0.0079(16)	-0.0004	0.
	UEHL	-0.2927	-0.3542	-0.0311	-0.0025
	U-FS	0.0031(1)	0.0039(1)	0.0002(1)	0.
	W.K.	0.0099(10)	0.0114(11)	0.0015(1)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2364(39)	0.2995(49)	0.0173(3)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5199(44)	1.9982(56)	0.1006(5)	0.2416(4)
Z = 71	SELF	1.5589(4)	2.0423(8)	0.1195(3)	0.2463(4)
	S-FS	-0.0064(10)	-0.0084(17)	-0.0005	0.
	UEHL	-0.2958	-0.3601	-0.0327	-0.0026
	U-FS	0.0033(1)	0.0042(1)	0.0002(1)	0.
	W.K.	0.0102(11)	0.0118(12)	0.0016(2)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2472(40)	0.3154(51)	0.0189(3)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5192(45)	2.0073(58)	0.1072(5)	0.2438(4)
Z = 72	SELF	1.5507(4)	2.0419(7)	0.1263(3)	0.2486(4)
	S-FS	-0.0069(10)	-0.0091(17)	-0.0006	0.
	UEHL	-0.2991	-0.3662	-0.0344	-0.0026
	U-FS	0.0036(1)	0.0046(1)	0.0002(1)	0.
	W.K.	0.0105(11)	0.0123(13)	0.0017(2)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2617(42)	0.3362(54)	0.0208(3)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5222(47)	2.0216(60)	0.1143(6)	0.2461(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 73	SELF	1.5431(4)	2.0422(7)	0.1333(3)	0.2509(4)
	S-FS	-0.0074(10)	-0.0098(17)	-0.0006	0.
	UEHL	-0.3025	-0.3727	-0.0362	-0.0027
	U-FS	0.0038(1)	0.0050(1)	0.0003(1)	0.
	W.K.	0.0108(12)	0.0127(14)	0.0018(2)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2740(44)	0.3547(57)	0.0227(4)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5237(49)	2.0341(63)	0.1215(6)	0.2483(4)
Z = 74	SELF	1.5359(5)	2.0432(6)	0.1405(3)	0.2532(4)
	S-FS	-0.0080(10)	-0.0106(18)	-0.0007	0.
	UEHL	-0.3061	-0.3794	-0.0381	-0.0028
	U-FS	0.0042(1)	0.0054(1)	0.0003(1)	0.
	W.K.	0.0111(13)	0.0132(15)	0.0019(2)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.2917(56)	0.3804(73)	0.0252(5)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5307(60)	2.0542(78)	0.1293(7)	0.2506(4)
Z = 75	SELF	1.5293(5)	2.0449(5)	0.1479(3)	0.2555(4)
	S-FS	-0.0084(10)	-0.0113(18)	-0.0008	0.
	UEHL	-0.3098	-0.3864	-0.0400	-0.0028
	U-FS	0.0045(1)	0.0059(1)	0.0004(1)	0.
	W.K.	0.0115(14)	0.0137(16)	0.0020(2)	0.0003
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3042(48)	0.3997(63)	0.0273(4)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5330(53)	2.0684(69)	0.1370(6)	0.2528(4)
Z = 76	SELF	1.5231(5)	2.0474(4)	0.1555(3)	0.2578(4)
	S-FS	-0.0090(10)	-0.0121(19)	-0.0009	0.
	UEHL	-0.3137	-0.3938	-0.0421	-0.0029
	U-FS	0.0048(1)	0.0064(1)	0.0004(1)	0.
	W.K.	0.0119(14)	0.0142(17)	0.0022(3)	0.0004
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3207(50)	0.4246(66)	0.0300(5)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5396(55)	2.0886(72)	0.1452(7)	0.2551(4)
Z = 77	SELF	1.5174(5)	2.0507(4)	0.1634(3)	0.2601(4)
	S-FS	-0.0097(11)	-0.0131(19)	-0.0010	0.
	UEHL	-0.3178	-0.4014	-0.0444	-0.0030
	U-FS	0.0052(1)	0.0070(1)	0.0005(1)	0.
	W.K.	0.0122(15)	0.0147(18)	0.0023(3)	0.0004
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3383(52)	0.4513(69)	0.0330(5)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5475(57)	2.1112(76)	0.1539(7)	0.2573(4)
Z = 78	SELF	1.5122(6)	2.0547(3)	0.1715(3)	0.2624(4)
	S-FS	-0.0103(11)	-0.0140(20)	-0.0012	0.
	UEHL	-0.3220	-0.4095	-0.0467	-0.0030
	U-FS	0.0056(1)	0.0076(1)	0.0005(1)	0.
	W.K.	0.0126(16)	0.0152(20)	0.0025(3)	0.0004
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3562(54)	0.4789(73)	0.0361(5)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5561(59)	2.1350(79)	0.1629(8)	0.2595(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 79	SELF	1.5074(6)	2.0594(2)	0.1798(3)	0.2648(4)
	S-FS	-0.0110(11)	-0.0150(20)	-0.0013	0.
	UEHL	-0.3264	-0.4179	-0.0492	-0.0031
	U-FS	0.0061(1)	0.0083(1)	0.0006(1)	0.
	W.K.	0.0130(17)	0.0158(21)	0.0027(4)	0.0004(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3754(12)	0.5088(17)	0.0396(1)	0.
	R.R.	0.0006(6)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5663(28)	2.1614(37)	0.1724(6)	0.2619(4)
Z = 80	SELF	1.5032(6)	2.0650(2)	0.1884(3)	0.2671(4)
	S-FS	-0.0118(11)	-0.0162(21)	-0.0015	0.
	UEHL	-0.3310	-0.4267	-0.0518	-0.0032
	U-FS	0.0066(1)	0.0091(1)	0.0006(1)	0.
	W.K.	0.0134(18)	0.0164(22)	0.0028(4)	0.0004(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.3982(59)	0.5441(81)	0.0437(6)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5804(65)	2.1936(88)	0.1826(9)	0.2641(4)
Z = 81	SELF	1.4994(6)	2.0714(2)	0.1973(3)	0.2694(4)
	S-FS	-0.0126(11)	-0.0174(22)	-0.0017	0.
	UEHL	-0.3358	-0.4359	-0.0546	-0.0033
	U-FS	0.0071(2)	0.0099(5)	0.0007(1)	0.
	W.K.	0.0138(19)	0.0170(24)	0.0030(4)	0.0004(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.4189(1)	0.5771(2)	0.0479	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.5927(27)	2.2241(36)	0.1929(6)	0.2664(4)
Z = 82	SELF	1.4961(6)	2.0786(2)	0.2065(3)	0.2718(4)
	S-FS	-0.0134(12)	-0.0187(22)	-0.0019	0.
	UEHL	-0.3409	-0.4456	-0.0575	-0.0034
	U-FS	0.0077(2)	0.0108(5)	0.0008(1)	0.
	W.K.	0.0142(21)	0.0176(25)	0.0033(5)	0.0005(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.4428(1)	0.6151(2)	0.0527	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.6083(28)	2.2598(37)	0.2041(6)	0.2687(4)
Z = 83	SELF	1.4933(6)	2.0867(2)	0.2160(3)	0.2741(4)
	S-FS	-0.0144(12)	-0.0201(23)	-0.0021	0.
	UEHL	-0.3462	-0.4557	-0.0606	-0.0034
	U-FS	0.0084(2)	0.0118(5)	0.0009(1)	0.
	W.K.	0.0147(22)	0.0183(27)	0.0035(5)	0.0005(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.4688(7)	0.6568(9)	0.0581(1)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.6265(30)	2.2997(40)	0.2159(7)	0.2710(4)
Z = 84	SELF	1.4910(6)	2.0956(2)	0.2259(3)	0.2765(4)
	S-FS	-0.0153(12)	-0.0215(24)	-0.0023	0.
	UEHL	-0.3517	-0.4664	-0.0639	-0.0035
	U-FS	0.0091(2)	0.0129(5)	0.0011(1)	0.
	W.K.	0.0151(23)	0.0190(29)	0.0037(6)	0.0005(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.4942(70)	0.6983(100)	0.0637(9)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.6442(77)	2.3398(108)	0.2283(11)	0.2733(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 85	SELF	1.4892(7)	2.1054(2)	0.2361(3)	0.2788(4)
	S-FS	-0.0165(12)	-0.0233(25)	-0.0026	0.
	UEHL	-0.3574	-0.4776	-0.0674	-0.0036
	U-FS	0.0099(2)	0.0142(5)	0.0012(1)	0.
	W.K.	0.0156(24)	0.0197(31)	0.0040(6)	0.0005(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.5258(74)	0.7494(105)	0.0705(10)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.6684(80)	2.3898(114)	0.2419(12)	0.2755(4)
Z = 86	SELF	1.4879(7)	2.1162(2)	0.2467(2)	0.2812(4)
	S-FS	-0.0178(13)	-0.0253(26)	-0.0029	0.
	UEHL	-0.3635	-0.4893	-0.0712	-0.0037
	U-FS	0.0108(2)	0.0157(5)	0.0014(1)	0.
	W.K.	0.0161(26)	0.0204(33)	0.0042(7)	0.0005(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.5621(78)	0.8082(112)	0.0785(11)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.6974(84)	2.4478(120)	0.2568(13)	0.2779(4)
Z = 87	SELF	1.4871(7)	2.1279(3)	0.2577(2)	0.2835(4)
	S-FS	-0.0189(13)	-0.0271(27)	-0.0033	0.
	UEHL	-0.3698	-0.5017	-0.0752	-0.0038
	U-FS	0.0117(2)	0.0171(5)	0.0015(1)	0.
	W.K.	0.0166(27)	0.0212(35)	0.0045(7)	0.0006(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.5937(81)	0.8612(118)	0.0862(12)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.7221(88)	2.5007(127)	0.2718(14)	0.2801(4)
Z = 88	SELF	1.4869(7)	2.1406(3)	0.2691(3)	0.2859(4)
	S-FS	-0.0203(13)	-0.0292(28)	-0.0037	0.
	UEHL	-0.3764	-0.5147	-0.0794	-0.0038
	U-FS	0.0127(2)	0.0188(5)	0.0017(1)	0.
	W.K.	0.0171(29)	0.0220(37)	0.0048(8)	0.0006(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.6300(85)	0.9223(125)	0.0953(13)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.7519(92)	2.5618(134)	0.2881(16)	0.2824(4)
Z = 89	SELF	1.4871(7)	2.1542(3)	0.2810(3)	0.2882(4)
	S-FS	-0.0216(14)	-0.0313(29)	-0.0041	0.
	UEHL	-0.3834	-0.5284	-0.0839	-0.0039
	U-FS	0.0138(2)	0.0206(5)	0.0020(1)	0.
	W.K.	0.0176(31)	0.0229(40)	0.0052(9)	0.0006(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.6662(89)	0.9843(132)	0.1049(14)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.7816(97)	2.6242(142)	0.3052(17)	0.2847(4)
Z = 90	SELF	1.4880(7)	2.1690(3)	0.2934(3)	0.2906(4)
	S-FS	-0.0232(14)	-0.0338(30)	-0.0046(1)	0.
	UEHL	-0.3907	-0.5429	-0.0887	-0.0040
	U-FS	0.0151(2)	0.0227(5)	0.0023(1)	0.
	W.K.	0.0182(33)	0.0238(43)	0.0055(10)	0.0006(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.7106(94)	1.0596(140)	0.1164(15)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.8198(102)	2.7004(150)	0.3245(19)	0.2870(4)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 91	SELF	1.4894(7)	2.1849(3)	0.3063(3)	0.2930(4)
	S-FS	-0.0246(14)	-0.0362(31)	-0.0051(1)	0.
	UEHL	-0.3983	-0.5582	-0.0939	-0.0041
	U-FS	0.0163(3)	0.0249(5)	0.0026(1)	0.
	W.K.	0.0188(35)	0.0247(46)	0.0059(11)	0.0007(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.7498(98)	1.1288(148)	0.1279(17)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.8532(106)	2.7709(159)	0.3439(20)	0.2894(4)
Z = 92	SELF	1.4914(7)	2.2019(3)	0.3197(4)	0.2953(4)
	S-FS	-0.0266(15)	-0.0393(32)	-0.0057(1)	0.
	UEHL	-0.4064	-0.5743	-0.0994	-0.0042
	U-FS	0.0179(3)	0.0276(5)	0.0029(1)	0.
	W.K.	0.0194(37)	0.0257(49)	0.0063(12)	0.0007(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.8037(104)	1.2215(157)	0.1428(18)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.9012(112)	2.8651(169)	0.3668(22)	0.2916(4)
Z = 93	SELF	1.4941(7)	2.2201(3)	0.3338(4)	0.2977(4)
	S-FS	-0.0283(15)	-0.0420(33)	-0.0063(1)	0.
	UEHL	-0.4149	-0.5913	-0.1053	-0.0043
	U-FS	0.0194(3)	0.0302(5)	0.0033(1)	0.
	W.K.	0.0200(39)	0.0267(52)	0.0067(13)	0.0007(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.8495(109)	1.3036(167)	0.1571(20)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.9417(117)	2.9493(178)	0.3896(24)	0.2939(4)
Z = 94	SELF	1.4973(7)	2.2396(3)	0.3485(5)	0.3000(4)
	S-FS	-0.0305(16)	-0.0456(35)	-0.0071(1)	0.
	UEHL	-0.4238	-0.6094	-0.1116	-0.0044
	U-FS	0.0213(3)	0.0335(5)	0.0038(1)	0.
	W.K.	0.0207(41)	0.0278(55)	0.0072(14)	0.0007(1)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.9115(114)	1.4125(177)	0.1756(22)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	1.9982(124)	3.0605(190)	0.4166(27)	0.2962(4)
Z = 95	SELF	1.5013(8)	2.2604(3)	0.3638(6)	0.3024(4)
	S-FS	-0.0325(16)	-0.0489(36)	-0.0079(1)	0.
	UEHL	-0.4332	-0.6285	-0.1184	-0.0045
	U-FS	0.0232(3)	0.0369(5)	0.0043(1)	0.
	W.K.	0.0213(44)	0.0290(59)	0.0077(16)	0.0008(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	0.9650(120)	1.5105(188)	0.1937(24)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.0470(130)	3.1613(201)	0.4434(30)	0.2985(5)
Z = 96	SELF	1.5059(8)	2.2826(3)	0.3800(7)	0.3047(4)
	S-FS	-0.0349(17)	-0.0528(38)	-0.0088(1)	0.
	UEHL	-0.4432	-0.6487	-0.1256	-0.0046
	U-FS	0.0254(3)	0.0408(5)	0.0049(1)	0.
	W.K.	0.0220(46)	0.0302(63)	0.0082(17)	0.0008(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.0316(127)	1.6310(200)	0.2157(26)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.1087(137)	3.2850(214)	0.4746(32)	0.3007(5)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 97	SELF	1.5112(8)	2.3062(3)	0.3969(7)	0.3071(4)
	S-FS	-0.0372(17)	-0.0567(39)	-0.0098(1)	0.
	UEHL	-0.4537	-0.6703	-0.1335	-0.0047
	U-FS	0.0277(3)	0.0450(5)	0.0056(1)	0.
	W.K.	0.0228(49)	0.0314(67)	0.0088(19)	0.0008(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.0960(133)	1.7507(213)	0.2388(29)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.1687(144)	3.4083(227)	0.5070(35)	0.3031(5)
Z = 98	SELF	1.5172(8)	2.3315(3)	0.4146(8)	0.3094(4)
	S-FS	-0.0399(17)	-0.0614(41)	-0.0109(1)	0.
	UEHL	-0.4648	-0.6932	-0.1419	-0.0048
	U-FS	0.0304(3)	0.0500(5)	0.0064(1)	0.
	W.K.	0.0235(52)	0.0328(72)	0.0094(21)	0.0008(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.1732(140)	1.8935(226)	0.2664(32)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.2415(151)	3.5551(242)	0.5442(39)	0.3053(5)
Z = 99	SELF	1.5241(8)	2.3584(3)	0.4333(9)	0.3118(4)
	S-FS	-0.0429(18)	-0.0663(43)	-0.0122(1)	0.
	UEHL	-0.4766	-0.7175	-0.1510	-0.0049
	U-FS	0.0334(3)	0.0554(5)	0.0074(1)	0.
	W.K.	0.0243(55)	0.0342(77)	0.0101(23)	0.0009(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.2549(148)	2.0466(241)	0.2970(35)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.3191(160)	3.7126(257)	0.5848(43)	0.3076(5)
Z = 100	SELF	1.5317(8)	2.3870(3)	0.4530(10)	0.3141(4)
	S-FS	-0.0460(19)	-0.0717(45)	-0.0136(2)	0.
	UEHL	-0.4890	-0.7435	-0.1608	-0.0050
	U-FS	0.0367(3)	0.0616(5)	0.0085(1)	0.
	W.K.	0.0252(58)	0.0357(82)	0.0108(25)	0.0009(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.3433(156)	2.2142(257)	0.3316(39)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.4036(168)	3.8851(274)	0.6296(47)	0.3098(5)
Z = 101	SELF	1.5402(8)	2.4175(3)	0.4737(11)	0.3164(4)
	S-FS	-0.0493(19)	-0.0773(47)	-0.0152(2)	0.
	UEHL	-0.5023	-0.7713	-0.1715	-0.0051
	U-FS	0.0402(7)	0.0684(12)	0.0097(2)	0.
	W.K.	0.0261(62)	0.0372(88)	0.0115(27)	0.0009(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.4348(165)	2.3904(274)	0.3693(42)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.4916(178)	4.0668(292)	0.6779(52)	0.3121(5)
Z = 102	SELF	1.5495(8)	2.4499(3)	0.4957(12)	0.3187(4)
	S-FS	-0.0526(20)	-0.0832(49)	-0.0168(2)	0.
	UEHL	-0.5163	-0.8010	-0.1830	-0.0052
	U-FS	0.0441(7)	0.0758(12)	0.0112(2)	0.
	W.K.	0.0270(65)	0.0389(94)	0.0124(30)	0.0010(2)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.5293(174)	2.5757(292)	0.4107(47)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.5827(187)	4.2581(312)	0.7302(57)	0.3143(5)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leq Z \leq 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 103	SELF	1.5598(8)	2.4845(3)	0.5188(13)	0.3210(4)
	S-FS	-0.0565(20)	-0.0901(52)	-0.0188(2)	0.
	UEHL	-0.5313	-0.8328	-0.1956	-0.0053
	U-FS	0.0486(7)	0.0845(12)	0.0129(2)	0.
	W.K.	0.0279(69)	0.0407(101)	0.0133(33)	0.0010(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.6414(183)	2.7951(312)	0.4600(51)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.6917(198)	4.4839(333)	0.7907(63)	0.3165(5)
Z = 104	SELF	1.5710(8)	2.5213(3)	0.5433(14)	0.3233(4)
	S-FS	-0.0601(21)	-0.0964(54)	-0.0208(3)	0.
	UEHL	-0.5473	-0.8669	-0.2092	-0.0054
	U-FS	0.0532(7)	0.0936(12)	0.0148(2)	0.
	W.K.	0.0290(74)	0.0426(108)	0.0142(36)	0.0010(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.7430(193)	3.0016(333)	0.5098(57)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.7906(209)	4.6977(355)	0.8523(69)	0.3188(5)
Z = 105	SELF	1.5833(8)	2.5605(3)	0.5692(15)	0.3256(4)
	S-FS	-0.0651(22)	-0.1052(57)	-0.0234(3)	0.
	UEHL	-0.5644	-0.9037	-0.2241	-0.0055
	U-FS	0.0590(7)	0.1052(12)	0.0172(2)	0.
	W.K.	0.0300(78)	0.0446(116)	0.0153(40)	0.0011(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	1.8861(205)	3.2846(357)	0.5761(63)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	2.9308(221)	4.9878(380)	0.9304(76)	0.3210(5)
Z = 106	SELF	1.5966(8)	2.6022(3)	0.5967(16)	0.3279(4)
	S-FS	-0.0699(23)	-0.1139(60)	-0.0261(3)	0.
	UEHL	-0.5827	-0.9432	-0.2404	-0.0056
	U-FS	0.0652(7)	0.1176(12)	0.0199(2)	0.
	W.K.	0.0311(83)	0.0467(124)	0.0164(44)	0.0011(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	2.0251(217)	3.5671(381)	0.6461(69)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	3.0673(234)	5.2784(406)	1.0128(83)	0.3232(5)
Z = 107	SELF	1.6110(8)	2.6466(3)	0.6259(17)	0.3301(4)
	S-FS	-0.0749(23)	-0.1230(63)	-0.0291(4)	0.
	UEHL	-0.6023	-0.9860	-0.2582	-0.0057
	U-FS	0.0720(7)	0.1314(12)	0.0230(2)	0.
	W.K.	0.0323(88)	0.0490(134)	0.0177(48)	0.0012(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	2.1707(229)	3.8680(408)	0.7236(76)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	3.2106(247)	5.5880(435)	1.1031(92)	0.3253(5)
Z = 108	SELF	1.6265(8)	2.6939(3)	0.6569(18)	0.3323(4)
	S-FS	-0.0806(24)	-0.1336(67)	-0.0326(4)	0.
	UEHL	-0.6234	-1.0322	-0.2778	-0.0058
	U-FS	0.0798(7)	0.1476(12)	0.0267(2)	0.
	W.K.	0.0336(94)	0.0514(143)	0.0190(53)	0.0012(3)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	2.3396(243)	4.2178(438)	0.8153(85)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	3.3773(262)	5.9469(466)	1.2078(102)	0.3275(5)

TABLE II. Contributions to the Lamb Shift in Hydrogen-like Atoms, $1 \leqslant Z \leqslant 110$

See page 413 for Explanation of Tables

		$1s_{1/2}$	$2s_{1/2}$	$2p_{1/2}$	$2p_{3/2}$
Z = 109	SELF	1.6433(8)	2.7443(3)	0.6899(19)	0.3345(4)
	S-FS	-0.0869(25)	-0.1452(71)	-0.0365(4)	0.
	UEHL	-0.6461	-1.0823	-0.2993	-0.0060
	U-FS	0.0887(7)	0.1660(12)	0.0312(2)	0.
	W.K.	0.0349(100)	0.0540(154)	0.0205(59)	0.0012(4)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	2.5241(257)	4.6044(469)	0.9199(94)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	3.5598(278)	6.3432(499)	1.3259(112)	0.3296(6)
Z = 110	SELF	1.6614(8)	2.7980(3)	0.7250(20)	0.3367(4)
	S-FS	-0.0938(26)	-0.1579(75)	-0.0409(5)	0.
	UEHL	-0.6706	-1.1369	-0.3231	-0.0061
	U-FS	0.0987(7)	0.1871(12)	0.0364(2)	0.
	W.K.	0.0363(106)	0.0568(166)	0.0221(65)	0.0013(4)
	H.O.	0.0013(13)	0.0013(13)	0.0003(3)	-0.0001(1)
	F.S.	2.7271(273)	5.0343(504)	1.0399(104)	0.
	R.R.	0.0005(5)	0.0007(7)	-0.0001(1)	-0.0001(1)
	LAMB	3.7609(294)	6.7834(536)	1.4596(124)	0.3317(6)