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NON-DIPOLE EFFECTS IN PHOTOELECTRON ANGULAR DISTRIBUTIONS FOR RARE GAS ATOMS

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We present a theoretical study of $O(ka)$ and $O(k^2a^2)$ corrections to the dipole approximation in photoionization of rare gas atoms, where k is the magnitude of the photon wave vector and a is the radius of the ionized subshell. In the dipole approximation, the photoelectron angular distribution is characterized by the single parameter β. The $O(ka)$ corrections are characterized by two parameters γ and δ, and the $O(k^2a^2)$ corrections are characterized by three parameters λ, μ, and ν, constrained by the relation $\lambda + \mu + \nu = 0$ and a correction $\Delta\beta$ to the dipole parameter β. Formulas are given for the non-dipole parameters in terms of reduced matrix elements of electric and magnetic multipole operators. Tables and graphs of the seven angular distribution parameters, calculated in the relativistic independent-particle approximation (IPA), are given for electron energies ranging from 20 to 5000 eV for all 41 subshells of the rare gas atoms He, Ne, Ar, Kr, and Xe. Tables and graphs of the $O(ka)$ parameters are also given in the energy range 2–60 eV for the $n = 3$ and 4 shells of Kr, and for the $n = 4$ and 5 shells of Xe, where interesting non-dipole effects are found. Comparisons of the IPA calculations with correlated relativistic random-phase approximation calculations are made for selected subshells of Ar and Kr, illustrating the influence of correlation on the non-dipole parameters.

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CONTENTS

INTRODUCTION

The differential cross section for photoionization of an electron from a subshell of a closed-shell atom by a linearly polarized photon can be expanded to $O(k^2a^2)$, where k is the magnitude of the photon wave vector and a is the radius of the ionized subshell, as

$$\frac{d\sigma}{d\Omega}(\theta, \phi) = \frac{\sigma}{4\pi}\{1 + (\beta + \Delta\beta)P_2(\cos\theta) + (\delta + \gamma\cos^2\theta)\sin\theta\cos\phi + \lambda P_2(\cos\theta)\cos 2\phi + \mu\cos 2\phi + \nu(1 + \cos 2\phi)P_4(\cos\theta)\}. \quad (1)$$

The parameters λ, μ, and ν are constrained by $\lambda + \mu + \nu = 0$. In Eq. (1), the angles θ and ϕ are polar angles of the photoelectron momentum vector **p** in a coordinate system with the z axis directed along the polarization vector $\boldsymbol{\epsilon}$ and the x axis directed along the photon propagation direction **k**. To lowest order, $O(1)$, in an expansion in powers of ka, the angular distribution takes the dipole form, $1 + \beta P_2(\cos\theta)$, where the dipole angular-distribution parameter β results from interference between electric-dipole amplitudes. The leading $O(ka)$ non-dipole parameters δ and γ arise from interference of electric-dipole amplitudes with electric-quadrupole and magnetic-dipole amplitudes. The magnetic–dipole amplitudes vanish nonrelativistically and are negligible in relativistic calculations for energies below 5000 eV. The remaining $O(k^2a^2)$ parameters $\Delta\beta$, λ, μ, and ν result from interference of electric-dipole amplitudes with electric-octopole and magnetic-quadrupole amplitudes, from interference between electric-quadrupole amplitudes, and from retardation corrections to electric-dipole amplitudes.

The $O(ka)$ corrections to the dipole approximation were previously considered in the 1975 review paper of Amusia and Cherepkov [1], who gave formulas for dipole–quadrupole interference contributions to the photoionization differential cross section. In the past decade, there have been a number of theoretical investigations of the $O(ka)$ corrections that include detailed predictions of angular distributions. Notable among these are the calculations of Bechler and Pratt [2], who studied dipole–quadrupole interference effects on the photoelectron angular distribution for $1s$, $2s$, and $2p$ shells of elements with nuclear charges Z ranging from 6 to 40 in the Coulomb-field and screened Coulomb-field approximations. Scofield [3] gave general formulas for the interference contributions to the differential cross section and carried out detailed calculations of angular distributions

for Ne-like Ba and He-like Ni using a relativistic independent-particle approximation (IPA) based on the Dirac–Hartree–Slater central potential. The most detailed numerical calculations for neutral atoms are those of Cooper [4], who evaluated the dipole–quadrupole interference corrections nonrelativistically for the inner subshells of all noble-gas atoms from He to Xe in the IPA using a Herman–Skillman potential. Recently, Amusia et al. [5] carried out Hartree–Fock (HF) and random-phase approximation (RPA) calculations of the non-dipole parameter γ for the 1*s* and 3*s* subshells of argon at low energies. Large non-dipole effects were found and correlation corrections to γ were found to be significant for these cases.

Measurements of the non-dipole angular-distribution parameters for inner shells of Ar and Kr, reported in Refs. [6] and [7], are in excellent agreement with IPA calculations; however, measurements of $\gamma + 3\delta$ for the 2*p* subshells of Ne reported in [8] are systematically higher than the IPA predictions for energies above the Ne 1*s* threshold. In Ref. [9], random-phase approximation calculations were carried out to investigate the possible influence of correlation on the non-dipole parameters. These calculations confirmed a large intershell coupling effect on the dipole parameter β observed experimentally, but failed to explain the substantial differences between IPA calculations and experiment for the non-dipole parameter $\gamma + 3\delta$. Indeed, the RPA and IPA values for the non-dipole parameter were found to be in close agreement with one another. The differences between theory and experiment for the $n = 2$ shell of neon were subsequently shown to arise from corrections of $O(k^2a^2)$ and to be completely resolved in Ref. [10].

In Table I, we present the results of systematic calculations of the $O(1)$ angular-distribution parameter β; the $O(ka)$ parameters γ and δ; and the $O(k^2a^2)$ parameters $\Delta\beta$, λ, μ, and ν, for all 41 subshells of the rare gas atoms in the electron energy range 20–5000 eV. These calculations are carried out in the relativistic IPA using a modified Hartree potential. We use the relativistic theory to account for the fine-structure separation between atomic subshells. Numerical results are given in both tabular and graphical forms. Our aim is to provide a database that can be used to design future experiments. Comparisons of experimental measurements with the IPA data will also be helpful in improving theoretical models of photoionization. The present results for the $O(ka)$ parameters γ and δ are in fair agreement with previous calculations of Cooper [4], but provide more detail, especially in the low-energy region. Results of the $O(k^2a^2)$ parameters $\Delta\beta$, λ, μ, and ν for the $n = 2$ shell of neon were given previously in [10]; values of the $O(k^2a^2)$ parameters for other cases have not been published previously.

In Table II, we present values of β, δ, and γ for the $n = 3$ and 4 shells of Kr and for the $n = 4$ and 5 shells of Xe in the low electron energy range 2–60 eV. For some of these subshells, surprisingly large non-dipole effects are found.

To assess the importance of correlation corrections to the non-dipole parameters, we carry out relativistic random-phase approximation (RRPA) [11] calculations for selected subshells of Ar, Kr, and Xe. For photoelectron energies above 100 eV, we find close agreement between theoretical IPA parameters from Table I and those obtained from the RRPA. Moreover, the theoretical parameters are in excellent agreement with available experimental data. For photoelectron energies below 50 eV, where correlation effects are expected to be more important, we find substantial modifications of the IPA values of the angular distribution parameters given in Table II near "Cooper" minima (where the dominant dipole amplitude vanishes) of outer *ns* subshells; otherwise the IPA and RRPA calculations are found to be in good agreement.

THEORY

We designate multipole operators in a spherical basis by $q^{(\lambda)}_{JM}$, where $\lambda = 1$ for electric multipoles and $\lambda = 0$ for magnetic multipoles, and we introduce the single-particle reduced multipole matrix elements between a continuum state $\epsilon\kappa$ and a bound state $n_b\kappa_b$,

$$\mathcal{Q}^{(\lambda)}_J(\kappa,\ \kappa_b) = i^{-l+1}e^{i\delta_\kappa}\langle \epsilon\kappa \| q^{(\lambda)}_J \| n_b\kappa_b\rangle. \qquad (2)$$

Here, δ_κ is the phase shift of the continuum state and l is the orbital angular momentum of the continuum state. For convenience, we introduce the following notation for the lowest few multipole matrix elements:

$$\mathcal{D}_\kappa = \mathcal{Q}^{(1)}_1(\kappa,\ \kappa_b) \quad \text{(electric dipole)}$$

$$\mathcal{M}_\kappa = \mathcal{Q}^{(0)}_1(\kappa,\ \kappa_b) \quad \text{(magnetic dipole)}$$

$$\mathcal{Q}_\kappa = \mathcal{Q}^{(1)}_2(\kappa,\ \kappa_b) \quad \text{(electric quadrupole)}$$

$$\mathcal{N}_\kappa = \mathcal{Q}^{(0)}_2(\kappa,\ \kappa_b) \quad \text{(magnetic quadrupole)}$$

$$\mathcal{O}_\kappa = \mathcal{Q}^{(1)}_3(\kappa,\ \kappa_b) \quad \text{(electric octopole)}.$$

With these definitions, we can write the contributions to $O(k^2a^2)$ to the cross section in the form

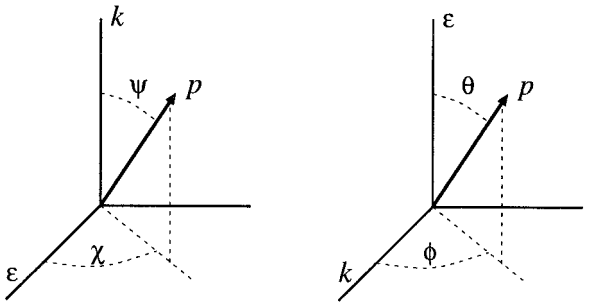

FIG. 1. Comparison of coordinate systems.

$$\sigma(\omega) = \frac{4\pi^2\alpha}{3}\,\omega\bar{\sigma}, \tag{3}$$

where α is the fine-structure constant, ω is the photon energy, and

$$\bar{\sigma} = \sum_{\kappa}\left[\left|\mathcal{D}_{\kappa}\right|^2 + \left|\mathcal{M}_{\kappa}\right|^2 + \frac{k^2}{20}\left|\mathcal{Q}_{\kappa}\right|^2\right]. \tag{4}$$

The photoelectron angular distribution can be written as

$$\frac{d\sigma}{d\Omega} = \frac{\sigma}{4\pi}\left[1 + \mathcal{A}(\psi, \chi)\right], \tag{5}$$

where (ψ, χ) are polar angles of $\mathbf{p}$ in a coordinate system with $\mathbf{k}$ along the z axis and $\boldsymbol{\epsilon}$ along the x axis. In Fig. 1, we compare this coordinate system with the (θ, ϕ) coordinate system used earlier in Eq. (1). The angular factor $\mathcal{A}(\psi, \chi)$ may be expressed as a sum over multipole interference terms

$$\mathcal{A}(\psi, \chi) = \sum_{mnL}\mathcal{A}^{(L)}_{P_mP_n}(\psi, \chi), \tag{6}$$

where the interference terms are given by

$$\mathcal{A}^{(2)}_{E_1E_1}(\psi, \chi) = -\frac{1}{2}\,\beta\left[P_2(\cos\psi) - \frac{3}{2}\cos 2\chi \sin^2\psi\right],$$

$$\beta = \frac{1}{\bar{\sigma}}\sum_{\kappa\kappa'}\sqrt{30}\langle\kappa'\|C_2\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 1 & 2 \\ j' & j & j_b \end{Bmatrix}\Re[\mathcal{D}_{\kappa}\mathcal{D}^*_{\kappa'}], \tag{7}$$

$$\mathcal{A}^{(1)}_{E_1M_1}(\psi, \chi) = \Delta_1 P_1(\cos\psi),$$

$$\Delta_1 = \frac{1}{\bar{\sigma}}\sum_{\kappa\kappa'} -3\sqrt{6}\langle\kappa'\|C_1\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 1 & 1 \\ j' & j & j_b \end{Bmatrix}\Im[\mathcal{D}_{\kappa}\mathcal{M}^*_{\kappa'}], \tag{8}$$

$$\mathcal{A}^{(1)}_{E_1E_2}(\psi, \chi) = \Gamma_1 P_1(\cos\psi),$$

$$\Gamma_1 = \frac{k}{\bar{\sigma}}\sum_{\kappa\kappa'}\frac{3}{10}\sqrt{30}\langle\kappa'\|C_1\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 2 & 1 \\ j' & j & j_b \end{Bmatrix}\Im[\mathcal{D}_{\kappa}\mathcal{Q}^*_{\kappa'}], \tag{9}$$

$$\mathcal{A}^{(3)}_{E_1E_2}(\psi, \chi) = \Gamma_3\left[P_3(\cos\psi) - \frac{5}{2}\cos 2\chi\cos\psi\sin^2\psi\right],$$

$$\Gamma_3 = \frac{k}{\bar{\sigma}}\sum_{\kappa\kappa'}\frac{1}{5}\sqrt{105}\langle\kappa'\|C_3\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 2 & 3 \\ j' & j & j_b \end{Bmatrix}\Im[\mathcal{D}_{\kappa}\mathcal{Q}^*_{\kappa'}], \tag{10}$$

$$\mathcal{A}^{(2)}_{E_1M_2}(\psi, \chi) = \Upsilon_2\left[P_2(\cos\psi) + \frac{1}{2}\cos 2\chi\sin^2\psi\right],$$

$$\Upsilon_2 = \frac{k}{\bar{\sigma}}\sum_{\kappa\kappa'} -\frac{1}{2}\sqrt{30}\langle\kappa'\|C_2\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 2 & 2 \\ j' & j & j_b \end{Bmatrix}\Re[\mathcal{D}_{\kappa}\mathcal{N}^*_{\kappa'}], \tag{11}$$

$$\mathcal{A}^{(2)}_{E_1E_3}(\psi, \chi) = \Lambda_2\left[P_2(\cos\psi) - \frac{1}{4}\cos 2\chi\sin^2\psi\right],$$

$$\Lambda_2 = \frac{k^2}{\bar{\sigma}}\sum_{\kappa\kappa'}\frac{4}{105}\sqrt{105}\langle\kappa'\|C_2\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 3 & 2 \\ j' & j & j_b \end{Bmatrix}\Re[\mathcal{D}_{\kappa}\mathcal{O}^*_{\kappa'}], \tag{12}$$

$$\mathcal{A}^{(4)}_{E_1E_3}(\psi, \chi) = \Lambda_4\left[P_4(\cos\psi) - \frac{5}{8}(7\cos^2\psi - 1)\sin^2\psi\cos 2\chi\right],$$

$$\Lambda_4 = \frac{k^2}{\bar{\sigma}}\sum_{\kappa\kappa'}\frac{6}{35}\sqrt{7}\langle\kappa'\|C_4\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 1 & 3 & 4 \\ j' & j & j_b \end{Bmatrix}\Re[\mathcal{D}_{\kappa}\mathcal{O}^*_{\kappa'}], \tag{13}$$

$$\mathcal{A}^{(2)}_{E_2E_2}(\psi, \chi) = \Pi_2\left[P_2(\cos\psi) + \frac{3}{2}\cos 2\chi \sin^2\psi \right],$$

$$\Pi_2 = \frac{k^2}{\bar{\sigma}} \sum_{\kappa\kappa'} -\frac{1}{56}\sqrt{70}\langle\kappa'\|C_2\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 2 & 2 & 2 \\ j' & j & j_b \end{Bmatrix} \Re[\mathfrak{Q}_\kappa \mathfrak{Q}^*_{\kappa'}], \quad (14)$$

$$\mathcal{A}^{(4)}_{E_2E_2}(\psi, \chi) = \Pi_4\left[P_4(\cos\psi) - \frac{5}{8}(7\cos^2\psi - 1)\sin^2\psi\cos 2\chi \right],$$

$$\Pi_4 = \frac{k^2}{\bar{\sigma}} \sum_{\kappa\kappa'} -\frac{3}{70}\sqrt{70}\langle\kappa'\|C_4\|\kappa\rangle(-1)^{j'+j_b} \times \begin{Bmatrix} 2 & 2 & 4 \\ j' & j & j_b \end{Bmatrix} \Re[\mathfrak{Q}_\kappa \mathfrak{Q}^*_{\kappa'}]. \quad (15)$$

In the above equations, $\Re[X]$ and $\Im[X]$ designate the real and imaginary parts of the argument X, respectively, and $\langle\kappa'\|C_k\|\kappa\rangle$ is the reduced matrix element of the spherical tensor

$$C_{kq}(\hat{r}) = \sqrt{\frac{4\pi}{2k+1}}\, Y_{kq}(\hat{r}).$$

We retain the tiny $O(ka)$ contribution from $E_1 - M_1$ interference in the present calculation, but we ignore the $O(k^2a^2)$ contributions from $M_1 - E_2$ and $M_1 - M_1$ interference. We summarize the above formulas as

$$\begin{aligned}\mathcal{A}(\psi, \chi) &= [\Delta_1 + \Gamma_1]P_1(\cos\psi) + \left[-\frac{1}{2}\beta + \Upsilon_2 + \Lambda_2 + \Pi_2 \right] \\ &\times P_2(\cos\psi) + \Gamma_3 P_3(\cos\psi) + [\Lambda_4 + \Pi_4]P_4(\cos\psi) \\ &+ \left[\frac{3}{4}\beta + \frac{1}{2}\Upsilon_2 - \frac{1}{4}\Lambda_2 + \frac{3}{2}\Pi_2 - \frac{5}{2}\Gamma_3\cos\psi \right] \\ &\times \sin^2\psi\cos 2\chi - \left[\frac{5}{8}\Lambda_4 + \frac{5}{8}\Pi_4 \right] \\ &\times (7\cos^2\psi - 1)\sin^2\psi\cos 2\chi. \end{aligned} \quad (16)$$

The following equations are used to transform from the coordinates (ψ, χ) to the coordinates (θ, ϕ) used in Eq. (1):

$$\sin\psi\cos\chi = \cos\theta,$$

$$\sin\psi\sin\chi = -\sin\theta\sin\phi,$$

$$\cos\psi = \sin\theta\cos\phi.$$

With the aid of these relations, we can re-express the angular distribution function $\mathcal{A}$ in terms of coordinates (θ, ϕ) as

$$\begin{aligned}\mathcal{A}(\theta, \phi) &= \left[\beta - \frac{3}{4}\Lambda_2 + \Pi_2 \right] P_2(\cos\theta) + [(\Delta_1 + \Gamma_1 + \Gamma_3) \\ &- 5\Gamma_3\cos^2\theta]\sin\theta\cos\phi + \left[-\frac{2}{3}\Upsilon_2 - \frac{5}{12}\Lambda_2 - \Pi_2 \right. \\ &\left. - \frac{5}{6}(\Lambda_4 + \Pi_4) \right] P_2(\cos\theta)\cos 2\phi \\ &+ \left[\frac{2}{3}\Upsilon_2 + \frac{5}{12}\Lambda_2 + \Pi_2 - \frac{1}{6}(\Lambda_4 + \Pi_4) \right] \cos 2\phi \\ &+ [\Lambda_4 + \Pi_4](1 + \cos 2\phi) P_4(\cos\theta) \end{aligned} \quad (17)$$

or, alternatively,

$$\begin{aligned}\mathcal{A}(\theta, \phi) &= (\beta + \Delta\beta) P_2(\cos\theta) + (\delta + \gamma\cos^2\theta)\sin\theta\cos\phi \\ &+ \lambda P_2(\cos\theta)\cos 2\phi + \mu\cos 2\phi \\ &+ \nu(1 + \cos 2\phi) P_4(\cos\theta). \end{aligned} \quad (18)$$

The terms of $O(ka)$ in Eq. (18) are

$$\delta = \Delta_1 + \Gamma_1 + \Gamma_3, \quad (19)$$

$$\gamma = -5\Gamma_3. \quad (20)$$

The M_1 amplitude, and therefore Δ_1, vanishes nonrelativistically. Furthermore, in the nonrelativistic limit $\Gamma_3 = -\Gamma_1$ for photoionization of *ns* subshells; consequently, δ vanishes in these subshells nonrelativistically. In the present relativistic calculations, δ is nonvanishing but negligibly small for *ns* subshells for energies below 5000 eV.

The terms of $O(k^2a^2)$ in Eq. (18) are

$$\Delta\beta = -\frac{3}{4}\Lambda_2 + \Pi_2, \quad (21)$$

$$\lambda = -\frac{2}{3}\Upsilon_2 - \frac{5}{12}\Lambda_2 - \Pi_2 - \frac{5}{6}(\Lambda_4 + \Pi_4), \quad (22)$$

$$\mu = \frac{2}{3}\,\Upsilon_2 + \frac{5}{12}\,\Lambda_2 + \Pi_2 - \frac{1}{6}\,(\Lambda_4 + \Pi_4), \qquad (23)$$

$$\nu = \Lambda_4 + \Pi_4. \qquad (24)$$

From the latter three equations, it follows that

$$\lambda + \mu + \nu = 0. \qquad (25)$$

We include retardation in the electric-dipole amplitudes in our numerical studies but ignore it elsewhere. We thereby account for all $O(k^2a^2)$ corrections.

The cross section for unpolarized photoionization is written in the form

$$\left.\frac{d\sigma}{d\Omega}\right|_{\text{unpol}} = \frac{\sigma}{4\pi}\,[1 + \sum_{l=1}^{\infty} B_l P_l(\cos\psi)], \qquad (26)$$

by Bechler and Pratt in Ref. [2] and by Scofield in Ref. [3]. Comparing Eqs. (16) and (26), we find that the parameters B_k are related to our coefficients by

$$B_1 = \Delta_1 + \Gamma_1 = \delta + \frac{1}{5}\,\gamma, \qquad (27)$$

$$B_2 = -\frac{1}{2}\,\beta + \Upsilon_2 + \Lambda_2 + \Pi_2$$

$$= -\frac{1}{2}\,[\beta + \Delta\beta] + \frac{1}{4}\,[5\mu - \lambda], \qquad (28)$$

$$B_3 = \Gamma_3 = -\frac{1}{5}\,\gamma, \qquad (29)$$

$$B_4 = \Lambda_4 + \Pi_4 = \nu. \qquad (30)$$

Amusia and Cherepkov [1] consider $E_1 - E_2$ interference effects and express the unpolarized cross section in the form

$$\left.\frac{d\sigma}{d\Omega}\right|_{\text{unpol}} = \frac{\sigma}{4\pi}\left[1 - \frac{1}{2}\,\beta P_2(\cos\psi) + k\gamma' P_1(\cos\psi) + k\eta' P_3(\cos\psi)\right]. \qquad (31)$$

The parameters $k\gamma'$ and $k\eta'$ are related to our parameters by

$$k\gamma' = \Gamma_1 = \delta + \frac{1}{5}\,\gamma, \qquad (32)$$

$$k\eta' = \Gamma_3 = -\frac{1}{5}\,\gamma. \qquad (33)$$

RELATIVISTIC INDEPENDENT-PARTICLE APPROXIMATION CALCULATIONS

The present relativistic IPA calculations of the angular-distribution parameters are carried out using wave functions obtained by solving the Dirac equation in a modified Hartree potential. For a closed-shell N-electron atom, this potential is defined by

$$V(r) = \sum_b\,(2j_b + 1)\,\frac{Y_0(b, r)}{r} - V_{\text{exc}}(r). \qquad (34)$$

The sum in the first term, which gives the direct part of the potential, ranges over all occupied subshells. The function $Y_0(b, r)/r$ is the Hartree screening potential for an electron in subshell b, and the exchange potential $V_{\text{exc}}(r)$ is given as $1/N$ of the direct potential. As in the Dirac–Hartree–Fock theory, the orbitals calculated in this modified Hartree potential are orthonormal. We solve the radial Dirac–Hartree equation (self-consistently) to obtain the bound-state orbitals $\phi_b(r)$, the bound-state energies E_b, and the potential $V(r)$. The continuum orbitals are then obtained by solving the Dirac equation in the same potential.

The non-dipole angular-distribution parameters, expressed as functions of electron energy E, are insensitive to the potential $V(r)$. Values of the $O(ka)$ parameters γ and δ from the present calculation are in excellent agreement with values from the relativistic screened Coulomb field calculations of Ref. [2] as well as values from the nonrelativistic Herman–Skillman calculations of Ref. [4]. However, theoretical binding energies E_b obtained using different potentials differ from one another and from the experimental binding energies. As a consequence, the angular-distribution parameters, expressed as functions of the theoretical photon energy $\omega = E + E_b$, depend on the potential. In Tables I and II, we express the angular-distribution parameters as functions of the photoelectron energy E to reduce the sensitivity to the starting potential, and we use the most accurate available values of E_b to determine the corresponding values of photon energy ω:

1. For the two outermost $np_{1/2}$ and $np_{3/2}$ subshells of the rare gas atoms, we use spectroscopic values of the binding energies from Moore [12].
2. For the K shells of Ne, Ar, Kr, and Xe, and for the

TABLE A
Inner-Shell Binding Energies E_b (eV) and References to Data Sources

Shell		He	Ref.	Ne	Ref.	Ar	Ref.	Kr	Ref.	Xe	Ref.
K	$1s$	24.6	[12]	870.2	[13]	3206.1	[13]	14327.1	[13]	34565.2	[13]
L_I	$2s$			53.0	[14]	327.3	[14]	1920.4	[13]	5452.6	[13]
L_{II}	$2p_{1/2}$			21.7	[12]	251.6	[14]	1730.9	[13]	5106.7	[13]
L_{III}	$2p_{3/2}$			21.6	[12]	249.5	[14]	1679.1	[13]	4786.5	[13]
M_I	$3s$					30.0	[14]	293.1	[14]	1150.5	[14]
M_{II}	$3p_{1/2}$					15.9	[12]	222.4	[14]	1003.5	[14]
M_{III}	$3p_{3/2}$					15.8	[12]	214.8	[14]	941.9	[14]
M_{IV}	$3d_{3/2}$							95.4	[14]	690.5	[14]
M_V	$3d_{5/2}$							94.2	[14]	677.9	[14]
N_I	$4s$							27.5	[15]	217.7	[15]
N_{II}	$4p_{1/2}$							14.7	[12]	163.9	[15]
N_{III}	$4p_{3/2}$							14.0	[12]	156.5	[15]
N_{IV}	$4d_{3/2}$									69.5	[15]
N_V	$4d_{5/2}$									67.6	[15]
O_I	$5s$									23.4	[15]
O_{II}	$5p_{1/2}$									13.4	[12]
O_{III}	$5p_{3/2}$									12.1	[12]

L shells of Kr and Xe, we use a recent reevaluation of the inner-shell binding energies by Deslattes et al. [13].

3. Otherwise, for L and M shells, we use the precise theoretical values of the binding energies from the many-body calculations of Indelicato, Boucard and Lindroth [14].

4. Finally, for the remaining N subshells of krypton and xenon, and the O_I subshell of xenon, we use experimental values of the binding energies from the tables of Sevier [15].

Values of E_b used here and their sources are given in Table A; the values are repeated in the headings of Tables I and II.

COMPARISON WITH THE RANDOM-PHASE APPROXIMATION

Although there is good consistency between IPA calculations starting from different potentials, it is nevertheless important to investigate the influence of electron correlation on the non-dipole parameters, especially at lower energies, where correlation corrections to cross sections and β-parameters are known to be significant. For this purpose, we employ the RRPA described in Ref. [11]. The RRPA starts from the Dirac–Hartree–Fock approximation and includes lowest-order correlation corrections together with those higher-order corrections obtained by iterating the lowest-order ones. Partial cross sections, dipole angular-distribution parameters, and spin-polarization parameters for the outer shells of Ar, Kr, and Xe calculated in the RRPA were published in Ref. [16].

The RRPA calculations are significantly more complex than the IPA calculations since the photoionization amplitudes from individual atomic subshells are coupled. Thus, in our RRPA calculations of the electric dipole photoionization amplitudes for Ar, all dipole excitations from $1s$, $2s$, and $3s$ subshells to continuum p states, and from the $2p$ and $3p$ subshells to continuum s and d states are included. This leads to a coupled 16-channel problem. Similarly, the RRPA calculation of electric quadrupole amplitudes leads to an 18-channel problem, in which $1s$, $2s$, and $3s$ subshells are excited to continuum d states, and $2p$ and $3p$ subshells are excited to continuum p and f states. It should be noted that, as in the IPA, the dipole and quadrupole transition amplitudes calculated using the RRPA are independent of gauge, so length-form and velocity-form amplitudes are identical. We neglect the tiny magnetic-dipole contributions in the present RRPA calculations.

High Energies

In Fig. 2, we compare IPA values of the $O(ka)$ parameter γ for the $1s$ and $2s$ shells of Ar given in Table I with RRPA values and with experimental results from [6]. The effects of correlation are seen to be insignificant for both cases and the theoretical calculations agree well with measurements. In Fig. 3, we make similar comparisons of γ for the $2s$ subshell of Kr and $\gamma + 3\delta$ for the $2p_{1/2}$ and $2p_{3/2}$ subshells of Kr. Again, agreement between theory and experiment is excellent. Differences between IPA values given in Table I and RRPA calculations, which measure the size of correlation effects, are seen to be insignificant. Moreover, when considered as functions of electron energy, values of

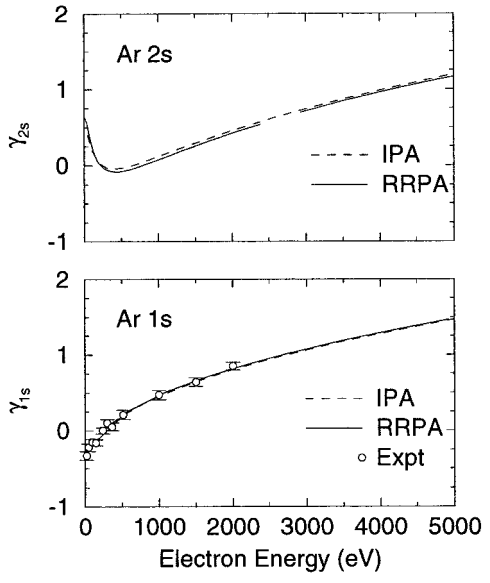

FIG. 2. Comparison of IPA and RRPA calculations of γ for the 1*s* and 2*s* shells of argon with one another and with experiment [6].

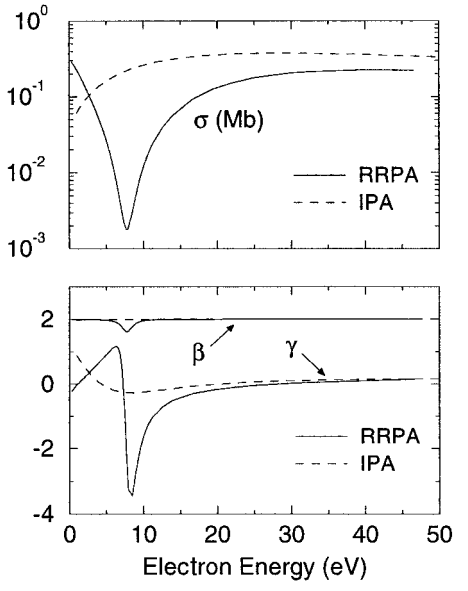

FIG. 4. Upper panel: Comparison of IPA and RRPA calculations for the Ar 3*s* cross section σ. Lower panel: Comparison of IPA and RRPA calculations of β and γ for the Ar 3*s* shell.

the non-dipole parameters for the $2p_{1/2}$ and $2p_{3/2}$ subshells are in close agreement. For the case of neon, correlation effects on $\gamma + 3\delta$ for the 2*p* subshells in the 1000 eV energy range were studied in Ref. [9] using both the nonrelativistic RPA with exchange [1] and the RRPA and also found to be unimportant.

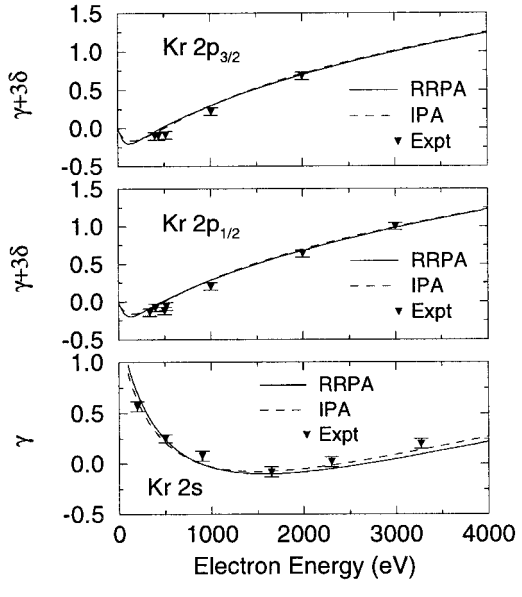

FIG. 3. Comparison of IPA and RRPA calculations of γ for the 2*s* subshell and $\gamma + 3\delta$ for the 2*p* subshells of krypton with one another and with experiment [7].

Low Energies

Since large correlation effects for the 3*s* subshell of Ar were found near threshold in Ref. [5], it is particularly interesting to compare IPA and RRPA calculations for low electron energies. In the lower panel of Fig. 4, we compare IPA calculations from Table II with RRPA calculations of β and γ for the 3*s* subshell of Ar and confirm the large value of γ_{3s} near threshold found in [5]. In the upper panel of the figure, both IPA and RRPA cross sections are shown. A deep "Cooper" minimum (where the $3s \rightarrow p$ amplitude vanishes) is observed in the RRPA cross section near threshold, and is responsible for the fluctuations of γ in this energy region. The corresponding Cooper minimum in IPA calculations is below threshold; correlation moves the minimum above threshold. A small departure of β from the expected value of 2 is also found at the position of the Cooper minimum. (It may be difficult to observe the rapid variations of γ in Ar owing to the smallness of the cross section in the energy region of interest.) The γ parameters for the 4*s* subshell of Kr and the 5*s* subshell of Xe behave similarly near threshold; there are fluctuations associated with Cooper minima in the $ns \rightarrow p$ amplitudes. In these cases, however, the minima in both IPA and RRPA amplitudes occur above threshold, so differences between IPA results shown in Table II and RRPA calculations are less dramatic. Results of detailed RRPA calculations for other low-energy cases will be published elsewhere.

Acknowledgments

The authors thank D. Lindle, H. Gould, and E. Kessler for useful discussions. The work of W.R.J. and A.D. was supported in part by NSF Grant Phy 99-70666. The work of K.T.C. was performed under the auspices of the U. S. Department of Energy by Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.

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EXPLANATION OF TABLES

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5000 eV)

Element symbol, ionized subshell, and binding energy are given above each tabulation.

E_b	Electron binding energy (eV) from Table A
E	Photoelectron energy (eV)
ω	Photon energy, $\omega = E + E_b$ (eV)
β	$O(1)$ angular-distribution parameter in Eq. (1)
δ, γ	$O(ka)$ angular-distribution parameters in Eq. (1); δ is negligibly small for ns subshells
$\Delta\beta$, λ, μ, ν	$O(k^2a^2)$ angular-distribution parameters in Eq. (1)

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

Element symbol, ionized subshell, and binding energy are given above each tabulation.

E_b	Electron binding energy (eV) from Table A
E	Photoelectron energy (eV)
ω	Photon energy, $\omega = E + E_b$ (eV)
β	$O(1)$ angular-distribution parameter in Eq. (1)
δ, γ	$O(ka)$ angular-distribution parameters in Eq. (1); δ is negligibly small for ns subshells

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5000 eV)

See page 162 for Explanation of Tables

$1s$ shell of He $\quad E_b = 24.6$ (eV) $\quad$ (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	44.6	1.9999	0.0794	-0.00003	0.00007	0.00010	-0.00016
40	64.6	1.9998	0.1169	-0.00008	0.00015	0.00020	-0.00035
60	84.6	1.9997	0.1474	-0.00014	0.00023	0.00032	-0.00055
80	104.6	1.9996	0.1741	-0.00019	0.00031	0.00044	-0.00075
100	124.6	1.9995	0.1982	-0.00025	0.00040	0.00056	-0.00097
120	144.6	1.9994	0.2204	-0.00031	0.00050	0.00069	-0.00119
140	164.6	1.9993	0.2411	-0.00037	0.00059	0.00083	-0.00142
160	184.6	1.9992	0.2606	-0.00044	0.00069	0.00096	-0.00165
180	204.6	1.9991	0.2791	-0.00050	0.00079	0.00110	-0.00189
200	224.6	1.9990	0.2967	-0.00057	0.00089	0.00124	-0.00213
250	274.6	1.9987	0.3375	-0.00074	0.00114	0.00160	-0.00274
300	324.6	1.9984	0.3747	-0.00091	0.00140	0.00196	-0.00337
350	374.6	1.9981	0.4089	-0.00108	0.00167	0.00233	-0.00400
400	424.6	1.9978	0.4409	-0.00126	0.00194	0.00271	-0.00465
450	474.6	1.9975	0.4709	-0.00144	0.00221	0.00309	-0.00530
500	524.6	1.9972	0.4992	-0.00162	0.00248	0.00347	-0.00595
600	624.6	1.9965	0.5519	-0.00199	0.00303	0.00424	-0.00727
700	724.6	1.9959	0.6002	-0.00236	0.00358	0.00501	-0.00859
800	824.6	1.9953	0.6449	-0.00274	0.00413	0.00579	-0.00992
900	924.6	1.9947	0.6868	-0.00311	0.00469	0.00656	-0.01125
1000	1024.6	1.9940	0.7263	-0.00349	0.00525	0.00734	-0.01259
1100	1124.6	1.9934	0.7637	-0.00386	0.00580	0.00812	-0.01392
1200	1224.6	1.9928	0.7993	-0.00424	0.00636	0.00890	-0.01525
1300	1324.6	1.9922	0.8334	-0.00462	0.00691	0.00967	-0.01659
1400	1424.6	1.9916	0.8660	-0.00499	0.00747	0.01045	-0.01792
1500	1524.6	1.9909	0.8975	-0.00537	0.00802	0.01123	-0.01925
1600	1624.6	1.9903	0.9278	-0.00575	0.00858	0.01200	-0.02058
1700	1724.6	1.9897	0.9572	-0.00612	0.00913	0.01278	-0.02191
1800	1824.6	1.9891	0.9856	-0.00650	0.00969	0.01355	-0.02324
1900	1924.6	1.9884	1.0132	-0.00688	0.01024	0.01433	-0.02457
2000	2024.6	1.9878	1.0400	-0.00725	0.01079	0.01510	-0.02589
2500	2524.6	1.9847	1.1642	-0.00913	0.01355	0.01896	-0.03251
3000	3024.6	1.9817	1.2755	-0.01099	0.01630	0.02279	-0.03909
3500	3524.6	1.9786	1.3771	-0.01286	0.01903	0.02661	-0.04565
4000	4024.6	1.9756	1.4709	-0.01472	0.02176	0.03042	-0.05218
4500	4524.6	1.9725	1.5585	-0.01656	0.02447	0.03421	-0.05868
5000	5024.6	1.9695	1.6406	-0.01830	0.02711	0.03790	-0.06501

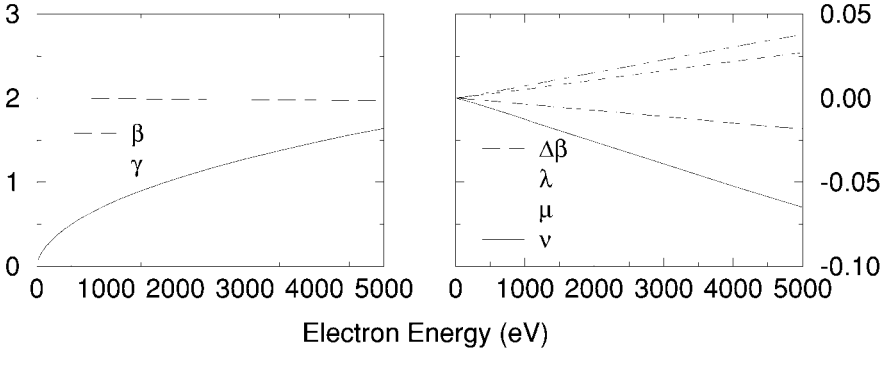

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$1s$ shell of Ne $E_b = 870.2$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	890.2	2.0000	-0.0339	0.00003	0.00000	-0.00001	0.00001
40	910.2	1.9999	-0.0333	0.00008	0.00000	0.00000	0.00000
60	930.2	1.9998	-0.0198	0.00012	0.00001	0.00002	-0.00004
80	950.2	1.9998	0.0002	0.00017	0.00004	0.00005	-0.00009
100	970.2	1.9997	0.0226	0.00020	0.00007	0.00009	-0.00016
120	990.2	1.9996	0.0456	0.00023	0.00010	0.00014	-0.00025
140	1010.2	1.9995	0.0682	0.00026	0.00014	0.00020	-0.00035
160	1030.2	1.9994	0.0901	0.00027	0.00019	0.00027	-0.00046
180	1050.2	1.9993	0.1111	0.00028	0.00024	0.00034	-0.00058
200	1070.2	1.9992	0.1311	0.00029	0.00030	0.00041	-0.00071
250	1120.2	1.9989	0.1774	0.00027	0.00045	0.00062	-0.00107
300	1170.2	1.9987	0.2190	0.00023	0.00061	0.00086	-0.00147
350	1220.2	1.9984	0.2569	0.00017	0.00079	0.00111	-0.00190
400	1270.2	1.9981	0.2917	0.00009	0.00098	0.00138	-0.00236
450	1320.2	1.9979	0.3241	0.00000	0.00118	0.00165	-0.00283
500	1370.2	1.9976	0.3545	-0.00010	0.00139	0.00194	-0.00333
600	1470.2	1.9971	0.4103	-0.00033	0.00181	0.00253	-0.00435
700	1570.2	1.9965	0.4609	-0.00058	0.00225	0.00315	-0.00540
800	1670.2	1.9960	0.5075	-0.00084	0.00270	0.00378	-0.00649
900	1770.2	1.9954	0.5510	-0.00112	0.00316	0.00443	-0.00759
1000	1870.2	1.9949	0.5918	-0.00141	0.00363	0.00508	-0.00871
1100	1970.2	1.9943	0.6303	-0.00170	0.00411	0.00574	-0.00985
1200	2070.2	1.9937	0.6670	-0.00201	0.00458	0.00641	-0.01099
1300	2170.2	1.9932	0.7020	-0.00231	0.00507	0.00708	-0.01215
1400	2270.2	1.9926	0.7355	-0.00262	0.00555	0.00776	-0.01331
1500	2370.2	1.9921	0.7678	-0.00294	0.00604	0.00844	-0.01448
1600	2470.2	1.9915	0.7989	-0.00326	0.00653	0.00913	-0.01566
1700	2570.2	1.9909	0.8290	-0.00358	0.00702	0.00982	-0.01684
1800	2670.2	1.9904	0.8581	-0.00390	0.00752	0.01051	-0.01802
1900	2770.2	1.9898	0.8864	-0.00422	0.00801	0.01120	-0.01921
2000	2870.2	1.9892	0.9138	-0.00455	0.00851	0.01190	-0.02041
2500	3370.2	1.9863	1.0411	-0.00620	0.01102	0.01540	-0.02642
3000	3870.2	1.9835	1.1553	-0.00787	0.01355	0.01894	-0.03249
3500	4370.2	1.9806	1.2596	-0.00956	0.01610	0.02249	-0.03859
4000	4870.2	1.9777	1.3560	-0.01126	0.01866	0.02606	-0.04472
4500	5370.2	1.9747	1.4462	-0.01297	0.02123	0.02965	-0.05087
5000	5870.2	1.9718	1.5310	-0.01468	0.02380	0.03323	-0.05703

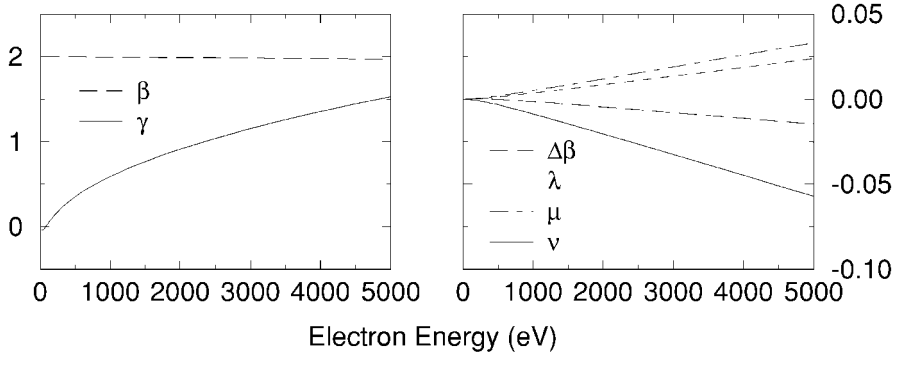

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2s$ shell of Ne $\quad E_b = 53.0$ (eV) $\quad$ (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	73.0	1.9993	0.1657	0.00002	0.00033	0.00047	-0.00080
40	93.0	1.9994	0.0910	-0.00003	0.00034	0.00048	-0.00082
60	113.0	1.9995	0.0353	-0.00007	0.00030	0.00043	-0.00073
80	133.0	1.9996	-0.0002	-0.00009	0.00025	0.00035	-0.00060
100	153.0	1.9997	-0.0205	-0.00009	0.00020	0.00028	-0.00047
120	173.0	1.9998	-0.0301	-0.00008	0.00015	0.00020	-0.00035
140	193.0	1.9999	-0.0324	-0.00006	0.00010	0.00014	-0.00024
160	213.0	1.9999	-0.0298	-0.00004	0.00006	0.00009	-0.00015
180	233.0	2.0000	-0.0238	-0.00002	0.00003	0.00004	-0.00007
200	253.0	2.0000	-0.0154	0.00001	0.00000	0.00000	0.00000
250	303.0	2.0000	0.0117	0.00007	-0.00004	-0.00005	0.00009
300	353.0	1.9999	0.0428	0.00012	-0.00004	-0.00005	0.00009
350	403.0	1.9999	0.0753	0.00016	-0.00001	-0.00001	0.00003
400	453.0	1.9997	0.1079	0.00017	0.00004	0.00006	-0.00011
450	503.0	1.9996	0.1400	0.00018	0.00012	0.00017	-0.00029
500	553.0	1.9994	0.1712	0.00016	0.00022	0.00031	-0.00053
600	653.0	1.9991	0.2309	0.00010	0.00046	0.00065	-0.00111
700	753.0	1.9986	0.2868	-0.00002	0.00076	0.00106	-0.00182
800	853.0	1.9982	0.3391	-0.00017	0.00109	0.00153	-0.00262
900	953.0	1.9977	0.3883	-0.00035	0.00146	0.00203	-0.00349
1000	1053.0	1.9972	0.4346	-0.00055	0.00184	0.00258	-0.00442
1100	1153.0	1.9967	0.4784	-0.00078	0.00225	0.00315	-0.00540
1200	1253.0	1.9962	0.5200	-0.00102	0.00267	0.00374	-0.00641
1300	1353.0	1.9957	0.5596	-0.00128	0.00311	0.00434	-0.00745
1400	1453.0	1.9951	0.5974	-0.00154	0.00355	0.00497	-0.00852
1500	1553.0	1.9946	0.6337	-0.00182	0.00401	0.00560	-0.00961
1600	1653.0	1.9940	0.6684	-0.00210	0.00447	0.00624	-0.01071
1700	1753.0	1.9935	0.7019	-0.00239	0.00493	0.00690	-0.01183
1800	1853.0	1.9929	0.7342	-0.00268	0.00540	0.00755	-0.01296
1900	1953.0	1.9924	0.7654	-0.00298	0.00588	0.00822	-0.01410
2000	2053.0	1.9918	0.7956	-0.00329	0.00636	0.00889	-0.01524
2500	2553.0	1.9890	0.9343	-0.00486	0.00879	0.01229	-0.02108
3000	3053.0	1.9862	1.0568	-0.00648	0.01127	0.01575	-0.02702
3500	3553.0	1.9833	1.1676	-0.00812	0.01377	0.01924	-0.03301
4000	4053.0	1.9804	1.2693	-0.00979	0.01629	0.02276	-0.03905
4500	4553.0	1.9776	1.3638	-0.01147	0.01882	0.02629	-0.04511
5000	5053.0	1.9747	1.4523	-0.01316	0.02136	0.02984	-0.05120

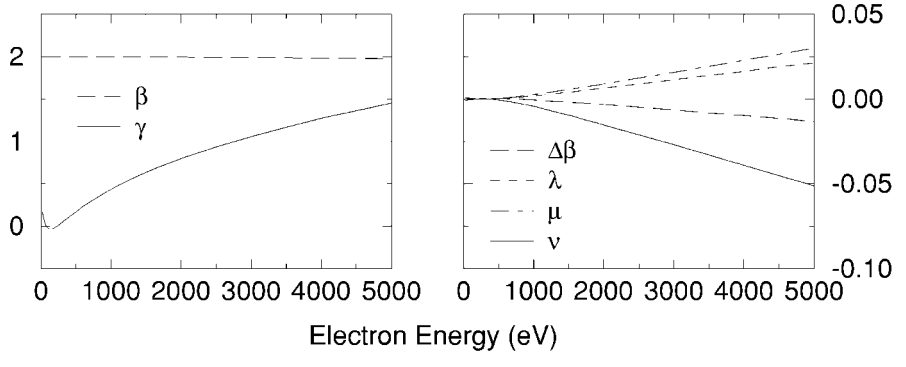

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{1/2}$ shell of Ne $\quad E_b = 21.7$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	41.7	1.0158	0.0084	0.0100	-0.00003	-0.00005	0.00004	0.00001
40	61.7	1.2892	0.0089	0.0301	-0.00005	-0.00005	0.00009	-0.00004
60	81.7	1.3949	0.0096	0.0475	-0.00008	-0.00005	0.00014	-0.00010
80	101.7	1.4428	0.0103	0.0643	-0.00012	-0.00004	0.00021	-0.00017
100	121.7	1.4634	0.0110	0.0810	-0.00015	-0.00003	0.00029	-0.00025
120	141.7	1.4691	0.0118	0.0977	-0.00019	-0.00002	0.00037	-0.00035
140	161.7	1.4659	0.0126	0.1142	-0.00023	-0.00001	0.00047	-0.00046
160	181.7	1.4571	0.0134	0.1304	-0.00027	0.00001	0.00057	-0.00058
180	201.7	1.4447	0.0143	0.1462	-0.00031	0.00003	0.00069	-0.00072
200	221.7	1.4298	0.0152	0.1617	-0.00036	0.00006	0.00081	-0.00087
250	271.7	1.3869	0.0175	0.1980	-0.00050	0.00013	0.00116	-0.00129
300	321.7	1.3404	0.0201	0.2311	-0.00065	0.00021	0.00154	-0.00175
350	371.7	1.2935	0.0228	0.2610	-0.00082	0.00031	0.00195	-0.00226
400	421.7	1.2474	0.0256	0.2878	-0.00100	0.00040	0.00239	-0.00279
450	471.7	1.2029	0.0285	0.3118	-0.00120	0.00050	0.00284	-0.00334
500	521.7	1.1604	0.0315	0.3335	-0.00140	0.00060	0.00331	-0.00391
600	621.7	1.0812	0.0376	0.3705	-0.00184	0.00078	0.00428	-0.00507
700	721.7	1.0097	0.0438	0.4007	-0.00230	0.00095	0.00528	-0.00623
800	821.7	0.9454	0.0500	0.4256	-0.00278	0.00109	0.00629	-0.00738
900	921.7	0.8874	0.0561	0.4464	-0.00327	0.00121	0.00731	-0.00852
1000	1021.7	0.8350	0.0622	0.4639	-0.00377	0.00131	0.00832	-0.00963
1100	1121.7	0.7876	0.0681	0.4788	-0.00427	0.00138	0.00933	-0.01071
1200	1221.7	0.7444	0.0739	0.4917	-0.00478	0.00143	0.01034	-0.01176
1300	1321.7	0.7051	0.0796	0.5028	-0.00528	0.00146	0.01134	-0.01280
1400	1421.7	0.6692	0.0852	0.5126	-0.00579	0.00147	0.01233	-0.01381
1500	1521.7	0.6363	0.0906	0.5213	-0.00630	0.00147	0.01332	-0.01479
1600	1621.7	0.6061	0.0959	0.5291	-0.00680	0.00145	0.01430	-0.01575
1700	1721.7	0.5782	0.1011	0.5361	-0.00731	0.00142	0.01527	-0.01668
1800	1821.7	0.5525	0.1061	0.5425	-0.00781	0.00137	0.01623	-0.01760
1900	1921.7	0.5287	0.1111	0.5484	-0.00831	0.00132	0.01719	-0.01851
2000	2021.7	0.5067	0.1159	0.5539	-0.00881	0.00126	0.01814	-0.01940
2500	2521.7	0.4170	0.1385	0.5773	-0.01128	0.00084	0.02285	-0.02369
3000	3021.7	0.3522	0.1588	0.5967	-0.01375	0.00030	0.02749	-0.02779
3500	3521.7	0.3035	0.1774	0.6146	-0.01611	-0.00034	0.03202	-0.03167
4000	4021.7	0.2659	0.1945	0.6313	-0.01852	-0.00105	0.03654	-0.03549
4500	4521.7	0.2362	0.2103	0.6482	-0.02074	-0.00179	0.04096	-0.03917
5000	5021.7	0.2120	0.2251	0.6643	-0.02324	-0.00240	0.04556	-0.04316

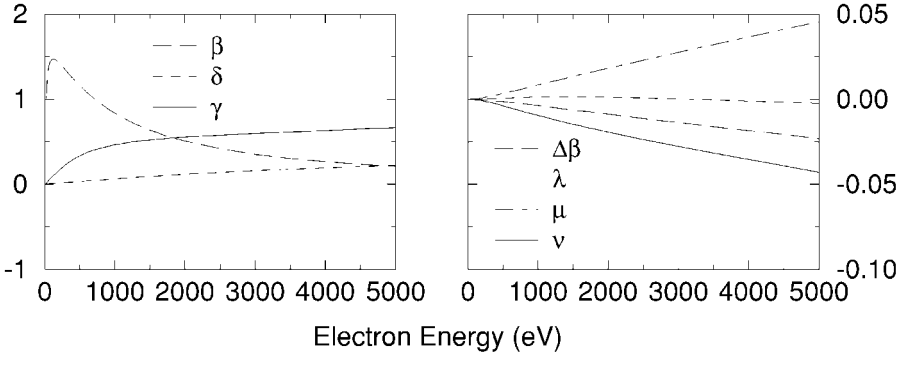

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{3/2}$ shell of Ne $\quad E_b = 21.6$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	41.6	1.0157	0.0084	0.0100	-0.00003	0.00000	-0.00001	0.00000
40	61.6	1.2894	0.0089	0.0301	-0.00005	0.00002	0.00002	-0.00004
60	81.6	1.3955	0.0096	0.0475	-0.00008	0.00004	0.00006	-0.00010
80	101.6	1.4437	0.0103	0.0644	-0.00012	0.00006	0.00010	-0.00017
100	121.6	1.4645	0.0110	0.0811	-0.00015	0.00009	0.00016	-0.00025
120	141.6	1.4704	0.0118	0.0978	-0.00019	0.00012	0.00023	-0.00035
140	161.6	1.4673	0.0126	0.1143	-0.00023	0.00016	0.00030	-0.00046
160	181.6	1.4586	0.0134	0.1306	-0.00027	0.00020	0.00039	-0.00059
180	201.6	1.4463	0.0143	0.1465	-0.00031	0.00024	0.00048	-0.00072
200	221.6	1.4315	0.0152	0.1619	-0.00036	0.00029	0.00058	-0.00087
250	271.6	1.3885	0.0175	0.1983	-0.00050	0.00042	0.00087	-0.00129
300	321.6	1.3420	0.0201	0.2315	-0.00065	0.00057	0.00119	-0.00176
350	371.6	1.2949	0.0228	0.2614	-0.00082	0.00073	0.00154	-0.00226
400	421.6	1.2488	0.0256	0.2882	-0.00101	0.00089	0.00191	-0.00280
450	471.6	1.2041	0.0285	0.3123	-0.00120	0.00106	0.00229	-0.00335
500	521.6	1.1614	0.0315	0.3340	-0.00141	0.00123	0.00269	-0.00392
600	621.6	1.0818	0.0377	0.3710	-0.00185	0.00156	0.00352	-0.00508
700	721.6	1.0100	0.0439	0.4012	-0.00231	0.00188	0.00436	-0.00624
800	821.6	0.9452	0.0501	0.4260	-0.00279	0.00218	0.00522	-0.00740
900	921.6	0.8868	0.0563	0.4467	-0.00328	0.00246	0.00607	-0.00853
1000	1021.6	0.8340	0.0623	0.4641	-0.00378	0.00272	0.00693	-0.00965
1100	1121.6	0.7861	0.0683	0.4788	-0.00428	0.00296	0.00777	-0.01073
1200	1221.6	0.7426	0.0742	0.4915	-0.00478	0.00317	0.00861	-0.01178
1300	1321.6	0.7029	0.0799	0.5025	-0.00529	0.00338	0.00944	-0.01282
1400	1421.6	0.6665	0.0856	0.5121	-0.00580	0.00356	0.01026	-0.01382
1500	1521.6	0.6332	0.0911	0.5205	-0.00631	0.00373	0.01108	-0.01480
1600	1621.6	0.6026	0.0964	0.5281	-0.00681	0.00388	0.01188	-0.01576
1700	1721.6	0.5743	0.1017	0.5349	-0.00732	0.00402	0.01267	-0.01669
1800	1821.6	0.5482	0.1068	0.5411	-0.00782	0.00415	0.01346	-0.01761
1900	1921.6	0.5241	0.1118	0.5468	-0.00832	0.00427	0.01424	-0.01851
2000	2021.6	0.5016	0.1167	0.5520	-0.00882	0.00438	0.01502	-0.01940
2500	2521.6	0.4101	0.1397	0.5740	-0.01130	0.00483	0.01883	-0.02366
3000	3021.6	0.3435	0.1605	0.5918	-0.01377	0.00515	0.02258	-0.02773
3500	3521.6	0.2932	0.1796	0.6081	-0.01612	0.00535	0.02621	-0.03156
4000	4021.6	0.2541	0.1972	0.6231	-0.01853	0.00547	0.02985	-0.03532
4500	4521.6	0.2227	0.2136	0.6381	-0.02074	0.00556	0.03338	-0.03893
5000	5021.6	0.1971	0.2290	0.6523	-0.02325	0.00575	0.03711	-0.04287

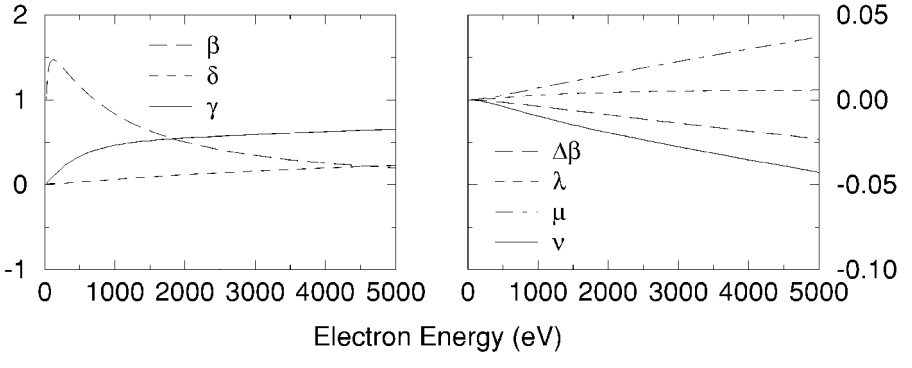

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$1s$ shell of Ar $E_b = 3206.1$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	3226.1	1.9992	-0.2504	0.00024	0.00026	0.00036	-0.00061
40	3246.1	1.9992	-0.2212	0.00031	0.00022	0.00031	-0.00054
60	3266.1	1.9991	-0.1913	0.00045	0.00019	0.00026	-0.00045
80	3286.1	1.9990	-0.1648	0.00060	0.00015	0.00021	-0.00036
100	3306.1	1.9989	-0.1405	0.00075	0.00013	0.00017	-0.00030
120	3326.1	1.9988	-0.1177	0.00087	0.00011	0.00015	-0.00026
140	3346.1	1.9987	-0.0961	0.00099	0.00010	0.00014	-0.00025
160	3366.1	1.9986	-0.0754	0.00109	0.00011	0.00015	-0.00025
180	3386.1	1.9985	-0.0556	0.00118	0.00012	0.00016	-0.00027
200	3406.1	1.9984	-0.0366	0.00125	0.00013	0.00018	-0.00031
250	3456.1	1.9982	0.0083	0.00141	0.00019	0.00026	-0.00045
300	3506.1	1.9979	0.0498	0.00153	0.00027	0.00038	-0.00065
350	3556.1	1.9976	0.0885	0.00163	0.00037	0.00051	-0.00089
400	3606.1	1.9973	0.1249	0.00169	0.00049	0.00067	-0.00116
450	3656.1	1.9971	0.1592	0.00174	0.00061	0.00085	-0.00146
500	3706.1	1.9968	0.1917	0.00177	0.00075	0.00104	-0.00179
600	3806.1	1.9962	0.2520	0.00178	0.00105	0.00146	-0.00251
700	3906.1	1.9957	0.3073	0.00175	0.00138	0.00191	-0.00329
800	4006.1	1.9951	0.3584	0.00168	0.00173	0.00240	-0.00413
900	4106.1	1.9946	0.4060	0.00157	0.00209	0.00291	-0.00501
1000	4206.1	1.9940	0.4507	0.00144	0.00248	0.00345	-0.00593
1100	4306.1	1.9935	0.4929	0.00129	0.00287	0.00400	-0.00688
1200	4406.1	1.9929	0.5330	0.00112	0.00328	0.00457	-0.00785
1300	4506.1	1.9923	0.5711	0.00093	0.00370	0.00515	-0.00885
1400	4606.1	1.9918	0.6076	0.00073	0.00413	0.00575	-0.00987
1500	4706.1	1.9912	0.6425	0.00052	0.00456	0.00635	-0.01091
1600	4806.1	1.9906	0.6761	0.00030	0.00500	0.00697	-0.01197
1700	4906.1	1.9900	0.7085	0.00006	0.00545	0.00759	-0.01303
1800	5006.1	1.9895	0.7398	-0.00018	0.00590	0.00822	-0.01411
1900	5106.1	1.9889	0.7701	-0.00043	0.00635	0.00885	-0.01520
2000	5206.1	1.9883	0.7995	-0.00068	0.00681	0.00949	-0.01631
2500	5706.1	1.9855	0.9349	-0.00204	0.00916	0.01277	-0.02193
3000	6206.1	1.9826	1.0552	-0.00350	0.01157	0.01612	-0.02769
3500	6706.1	1.9797	1.1643	-0.00502	0.01401	0.01953	-0.03354
4000	7206.1	1.9768	1.2646	-0.00658	0.01649	0.02297	-0.03946
4500	7706.1	1.9739	1.3578	-0.00817	0.01898	0.02644	-0.04541
5000	8206.1	1.9710	1.4452	-0.00978	0.02148	0.02992	-0.05140

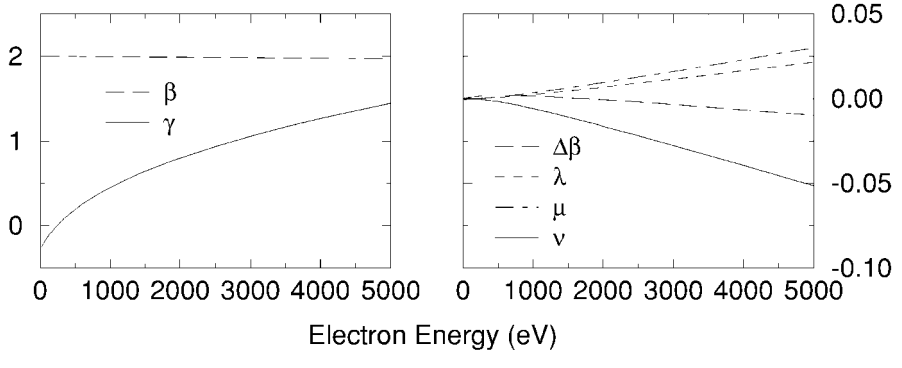

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2s$ shell of Ar $\quad E_b = 327.3$ (eV) $\quad$ (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	347.3	1.9961	0.5741	0.00137	0.00128	0.00179	-0.00307
40	367.3	1.9968	0.4536	0.00083	0.00119	0.00167	-0.00286
60	387.3	1.9972	0.3525	0.00028	0.00132	0.00185	-0.00317
80	407.3	1.9974	0.2741	-0.00021	0.00146	0.00205	-0.00350
100	427.3	1.9977	0.2115	-0.00059	0.00155	0.00217	-0.00372
120	447.3	1.9979	0.1608	-0.00087	0.00159	0.00223	-0.00382
140	467.3	1.9981	0.1194	-0.00106	0.00159	0.00223	-0.00383
160	487.3	1.9982	0.0854	-0.00119	0.00157	0.00220	-0.00377
180	507.3	1.9984	0.0574	-0.00127	0.00152	0.00214	-0.00366
200	527.3	1.9986	0.0344	-0.00132	0.00146	0.00205	-0.00352
250	577.3	1.9989	-0.0062	-0.00134	0.00129	0.00181	-0.00309
300	627.3	1.9992	-0.0296	-0.00127	0.00110	0.00154	-0.00263
350	677.3	1.9994	-0.0411	-0.00115	0.00091	0.00128	-0.00219
400	727.3	1.9996	-0.0445	-0.00101	0.00074	0.00104	-0.00178
450	777.3	1.9997	-0.0420	-0.00086	0.00059	0.00083	-0.00141
500	827.3	1.9998	-0.0353	-0.00071	0.00045	0.00064	-0.00109
600	927.3	1.9999	-0.0134	-0.00043	0.00024	0.00034	-0.00059
700	1027.3	1.9999	0.0154	-0.00017	0.00010	0.00014	-0.00025
800	1127.3	1.9998	0.0479	0.00005	0.00002	0.00003	-0.00005
900	1227.3	1.9997	0.0824	0.00023	-0.00001	-0.00001	0.00001
1000	1327.3	1.9995	0.1178	0.00038	0.00001	0.00002	-0.00003
1100	1427.3	1.9993	0.1536	0.00049	0.00007	0.00010	-0.00017
1200	1527.3	1.9990	0.1892	0.00058	0.00017	0.00023	-0.00040
1300	1627.3	1.9987	0.2245	0.00064	0.00029	0.00041	-0.00070
1400	1727.3	1.9984	0.2594	0.00067	0.00045	0.00063	-0.00108
1500	1827.3	1.9981	0.2937	0.00068	0.00063	0.00088	-0.00151
1600	1927.3	1.9977	0.3274	0.00067	0.00083	0.00116	-0.00200
1700	2027.3	1.9974	0.3605	0.00064	0.00106	0.00147	-0.00253
1800	2127.3	1.9970	0.3930	0.00059	0.00130	0.00181	-0.00311
1900	2227.3	1.9966	0.4249	0.00053	0.00156	0.00217	-0.00374
2000	2327.3	1.9961	0.4561	0.00045	0.00184	0.00256	-0.00440
2500	2827.3	1.9939	0.6035	-0.00015	0.00341	0.00476	-0.00817
3000	3327.3	1.9915	0.7378	-0.00100	0.00524	0.00730	-0.01254
3500	3827.3	1.9889	0.8611	-0.00203	0.00724	0.01009	-0.01733
4000	4327.3	1.9862	0.9749	-0.00320	0.00937	0.01306	-0.02242
4500	4827.3	1.9835	1.0808	-0.00448	0.01159	0.01615	-0.02774
5000	5327.3	1.9807	1.1797	-0.00583	0.01388	0.01934	-0.03321

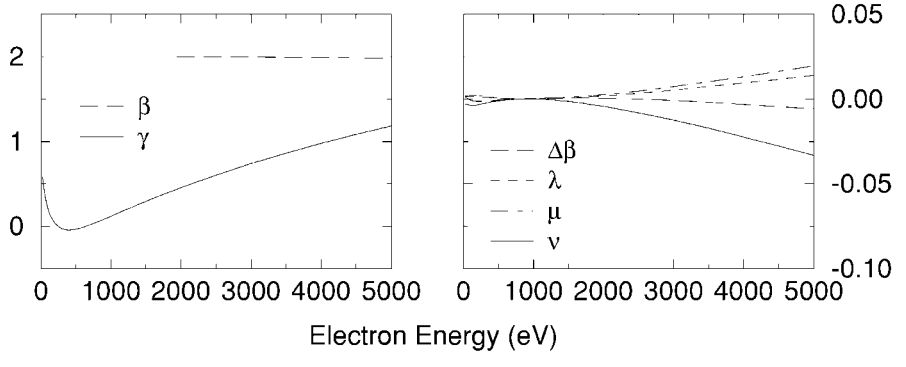

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{1/2}$ shell of Ar $\quad E_b = 251.6$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	271.6	0.6629	0.0077	-0.0454	0.00004	-0.00028	0.00005	0.00023
40	291.6	0.9243	0.0086	-0.0493	0.00007	-0.00028	0.00003	0.00025
60	311.6	1.0936	0.0099	-0.0418	0.00011	-0.00030	0.00003	0.00027
80	331.6	1.2037	0.0114	-0.0276	0.00014	-0.00033	0.00004	0.00029
100	351.6	1.2789	0.0127	-0.0103	0.00017	-0.00036	0.00007	0.00029
120	371.6	1.3322	0.0137	0.0081	0.00018	-0.00038	0.00011	0.00027
140	391.6	1.3710	0.0146	0.0263	0.00019	-0.00039	0.00016	0.00023
160	411.6	1.3997	0.0154	0.0441	0.00018	-0.00040	0.00023	0.00017
180	431.6	1.4212	0.0160	0.0612	0.00017	-0.00040	0.00030	0.00010
200	451.6	1.4373	0.0166	0.0776	0.00015	-0.00040	0.00038	0.00001
250	501.6	1.4616	0.0178	0.1158	0.00009	-0.00036	0.00061	-0.00025
300	551.6	1.4714	0.0190	0.1504	0.00000	-0.00031	0.00087	-0.00056
350	601.6	1.4725	0.0202	0.1822	-0.00010	-0.00025	0.00116	-0.00091
400	651.6	1.4683	0.0213	0.2116	-0.00022	-0.00018	0.00147	-0.00129
450	701.6	1.4605	0.0225	0.2391	-0.00034	-0.00010	0.00179	-0.00169
500	751.6	1.4503	0.0237	0.2649	-0.00047	-0.00001	0.00212	-0.00211
600	851.6	1.4256	0.0263	0.3124	-0.00076	0.00017	0.00282	-0.00300
700	951.6	1.3979	0.0290	0.3553	-0.00106	0.00037	0.00356	-0.00393
800	1051.6	1.3690	0.0318	0.3944	-0.00138	0.00057	0.00434	-0.00491
900	1151.6	1.3397	0.0348	0.4303	-0.00171	0.00078	0.00514	-0.00592
1000	1251.6	1.3107	0.0378	0.4635	-0.00206	0.00098	0.00597	-0.00695
1100	1351.6	1.2823	0.0409	0.4943	-0.00242	0.00119	0.00682	-0.00801
1200	1451.6	1.2545	0.0441	0.5230	-0.00280	0.00139	0.00770	-0.00909
1300	1551.6	1.2276	0.0474	0.5497	-0.00318	0.00160	0.00859	-0.01018
1400	1651.6	1.2015	0.0506	0.5748	-0.00358	0.00179	0.00949	-0.01129
1500	1751.6	1.1762	0.0539	0.5984	-0.00398	0.00199	0.01041	-0.01240
1600	1851.6	1.1518	0.0572	0.6205	-0.00440	0.00218	0.01135	-0.01353
1700	1951.6	1.1282	0.0606	0.6413	-0.00482	0.00237	0.01229	-0.01466
1800	2051.6	1.1054	0.0639	0.6610	-0.00525	0.00255	0.01325	-0.01580
1900	2151.6	1.0834	0.0673	0.6795	-0.00569	0.00273	0.01421	-0.01694
2000	2251.6	1.0621	0.0706	0.6971	-0.00613	0.00290	0.01518	-0.01809
2500	2751.6	0.9657	0.0873	0.7721	-0.00843	0.00368	0.02013	-0.02381
3000	3251.6	0.8836	0.1037	0.8305	-0.01083	0.00430	0.02514	-0.02945
3500	3751.6	0.8130	0.1196	0.8770	-0.01328	0.00478	0.03017	-0.03495
4000	4251.6	0.7517	0.1348	0.9146	-0.01576	0.00511	0.03517	-0.04028
4500	4751.6	0.6980	0.1496	0.9454	-0.01826	0.00533	0.04012	-0.04545
5000	5251.6	0.6506	0.1637	0.9712	-0.02075	0.00542	0.04501	-0.05044

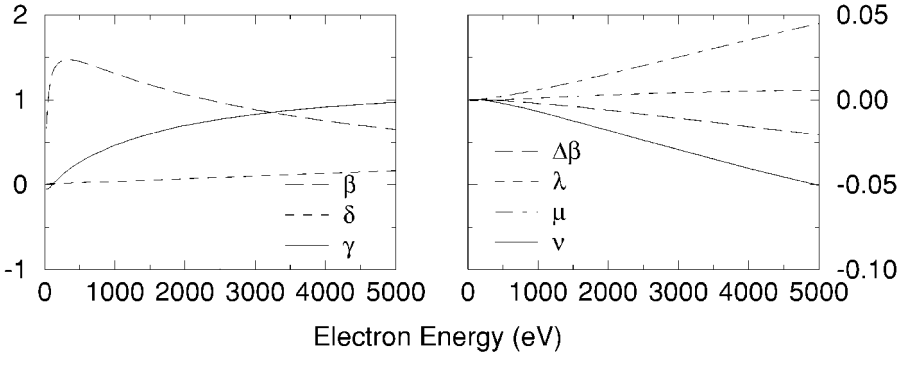

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{3/2}$ shell of Ar $E_b = 249.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	269.5	0.6590	0.0077	-0.0453	0.00003	0.00012	-0.00035	0.00023
40	289.5	0.9226	0.0086	-0.0494	0.00007	0.00010	-0.00035	0.00024
60	309.5	1.0935	0.0100	-0.0420	0.00011	0.00007	-0.00034	0.00027
80	329.5	1.2048	0.0115	-0.0278	0.00014	0.00004	-0.00033	0.00029
100	349.5	1.2808	0.0128	-0.0105	0.00017	0.00002	-0.00031	0.00029
120	369.5	1.3348	0.0139	0.0079	0.00018	0.00001	-0.00028	0.00027
140	389.5	1.3742	0.0147	0.0263	0.00019	0.00001	-0.00024	0.00023
160	409.5	1.4034	0.0155	0.0441	0.00018	0.00002	-0.00019	0.00017
180	429.5	1.4253	0.0161	0.0613	0.00017	0.00004	-0.00013	0.00009
200	449.5	1.4418	0.0167	0.0778	0.00015	0.00006	-0.00006	0.00001
250	499.5	1.4667	0.0179	0.1162	0.00009	0.00013	0.00012	-0.00026
300	549.5	1.4769	0.0191	0.1510	0.00000	0.00023	0.00034	-0.00057
350	599.5	1.4784	0.0202	0.1830	-0.00011	0.00035	0.00058	-0.00092
400	649.5	1.4744	0.0214	0.2127	-0.00022	0.00047	0.00083	-0.00131
450	699.5	1.4668	0.0225	0.2404	-0.00035	0.00061	0.00110	-0.00171
500	749.5	1.4568	0.0237	0.2664	-0.00048	0.00075	0.00138	-0.00214
600	849.5	1.4322	0.0263	0.3142	-0.00077	0.00105	0.00198	-0.00303
700	949.5	1.4044	0.0290	0.3573	-0.00107	0.00137	0.00260	-0.00398
800	1049.5	1.3754	0.0318	0.3967	-0.00139	0.00170	0.00326	-0.00496
900	1149.5	1.3459	0.0347	0.4328	-0.00173	0.00203	0.00394	-0.00598
1000	1249.5	1.3167	0.0378	0.4662	-0.00208	0.00237	0.00465	-0.00702
1100	1349.5	1.2879	0.0409	0.4971	-0.00245	0.00272	0.00537	-0.00809
1200	1449.5	1.2599	0.0441	0.5260	-0.00282	0.00306	0.00612	-0.00918
1300	1549.5	1.2326	0.0473	0.5528	-0.00321	0.00340	0.00688	-0.01028
1400	1649.5	1.2061	0.0506	0.5780	-0.00361	0.00374	0.00765	-0.01139
1500	1749.5	1.1805	0.0539	0.6016	-0.00402	0.00408	0.00843	-0.01252
1600	1849.5	1.1557	0.0573	0.6238	-0.00443	0.00442	0.00923	-0.01365
1700	1949.5	1.1317	0.0606	0.6446	-0.00486	0.00476	0.01004	-0.01479
1800	2049.5	1.1085	0.0640	0.6643	-0.00529	0.00509	0.01085	-0.01594
1900	2149.5	1.0861	0.0674	0.6828	-0.00573	0.00541	0.01168	-0.01709
2000	2249.5	1.0644	0.0708	0.7003	-0.00618	0.00574	0.01251	-0.01824
2500	2749.5	0.9658	0.0878	0.7748	-0.00849	0.00727	0.01672	-0.02399
3000	3249.5	0.8816	0.1045	0.8324	-0.01090	0.00867	0.02098	-0.02965
3500	3749.5	0.8088	0.1207	0.8776	-0.01336	0.00992	0.02525	-0.03517
4000	4249.5	0.7454	0.1365	0.9137	-0.01585	0.01103	0.02947	-0.04050
4500	4749.5	0.6897	0.1517	0.9429	-0.01836	0.01201	0.03364	-0.04565
5000	5249.5	0.6403	0.1664	0.9668	-0.02085	0.01286	0.03775	-0.05061

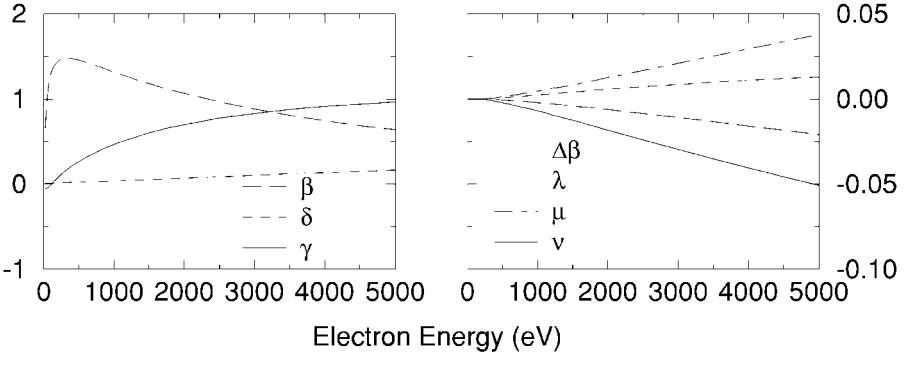

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3s$ shell of Ar $\quad E_b = 30.0$ (eV) $\quad$ (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	50.0	1.9991	-0.0104	-0.00010	0.00006	0.00008	-0.00014
40	70.0	1.9993	0.1419	0.00029	0.00000	0.00000	-0.00001
60	90.0	1.9992	0.1611	0.00047	0.00005	0.00007	-0.00011
80	110.0	1.9990	0.1495	0.00045	0.00015	0.00021	-0.00035
100	130.0	1.9990	0.1288	0.00034	0.00026	0.00037	-0.00063
120	150.0	1.9990	0.1057	0.00019	0.00037	0.00053	-0.00090
140	170.0	1.9990	0.0832	0.00003	0.00047	0.00066	-0.00113
160	190.0	1.9990	0.0622	-0.00011	0.00054	0.00076	-0.00131
180	210.0	1.9990	0.0434	-0.00024	0.00060	0.00084	-0.00144
200	230.0	1.9991	0.0269	-0.00034	0.00063	0.00089	-0.00153
250	280.0	1.9992	-0.0051	-0.00053	0.00067	0.00094	-0.00160
300	330.0	1.9994	-0.0255	-0.00062	0.00064	0.00090	-0.00154
350	380.0	1.9995	-0.0366	-0.00065	0.00058	0.00081	-0.00139
400	430.0	1.9996	-0.0407	-0.00063	0.00050	0.00070	-0.00120
450	480.0	1.9997	-0.0394	-0.00057	0.00041	0.00058	-0.00100
500	530.0	1.9998	-0.0340	-0.00050	0.00033	0.00047	-0.00080
600	630.0	1.9999	-0.0147	-0.00032	0.00019	0.00026	-0.00045
700	730.0	1.9999	0.0116	-0.00014	0.00008	0.00011	-0.00019
800	830.0	1.9998	0.0419	0.00004	0.00002	0.00002	-0.00004
900	930.0	1.9997	0.0744	0.00019	-0.00001	-0.00001	0.00001
1000	1030.0	1.9996	0.1079	0.00032	0.00001	0.00002	-0.00003
1100	1130.0	1.9994	0.1419	0.00042	0.00006	0.00009	-0.00015
1200	1230.0	1.9991	0.1759	0.00049	0.00015	0.00021	-0.00036
1300	1330.0	1.9989	0.2097	0.00055	0.00026	0.00037	-0.00063
1400	1430.0	1.9986	0.2432	0.00058	0.00040	0.00056	-0.00096
1500	1530.0	1.9983	0.2762	0.00059	0.00057	0.00079	-0.00135
1600	1630.0	1.9980	0.3088	0.00058	0.00075	0.00105	-0.00180
1700	1730.0	1.9976	0.3409	0.00055	0.00095	0.00133	-0.00229
1800	1830.0	1.9973	0.3724	0.00051	0.00118	0.00164	-0.00282
1900	1930.0	1.9969	0.4034	0.00046	0.00142	0.00198	-0.00339
2000	2030.0	1.9965	0.4339	0.00038	0.00167	0.00233	-0.00400
2500	2530.0	1.9944	0.5787	-0.00015	0.00315	0.00439	-0.00753
3000	3030.0	1.9920	0.7120	-0.00094	0.00488	0.00680	-0.01168
3500	3530.0	1.9895	0.8350	-0.00191	0.00681	0.00949	-0.01630
4000	4030.0	1.9869	0.9492	-0.00303	0.00887	0.01237	-0.02124
4500	4530.0	1.9842	1.0556	-0.00426	0.01105	0.01540	-0.02644
5000	5030.0	1.9815	1.1553	-0.00557	0.01329	0.01852	-0.03181

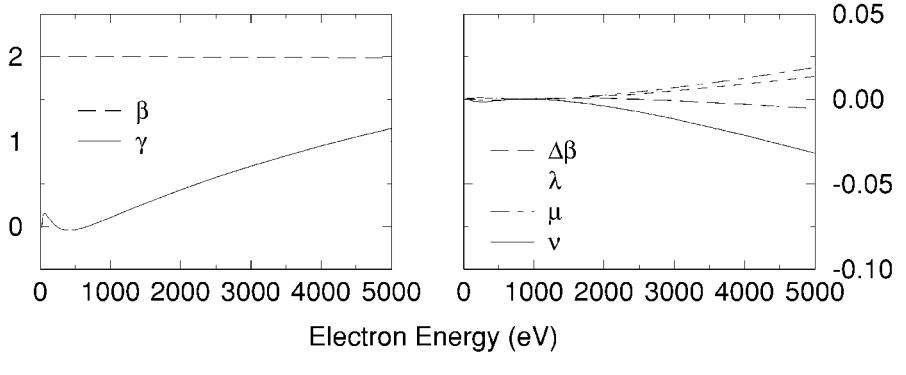

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{1/2}$ shell of Ar $\quad E_b = 15.9$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	35.9	1.1890	-0.0213	0.1129	0.00030	-0.00004	0.00028	-0.00024
40	55.9	0.4586	-0.0154	0.1116	0.00017	0.00015	0.00051	-0.00065
60	75.9	1.0915	-0.0075	0.0279	0.00004	0.00016	0.00032	-0.00048
80	95.9	1.3287	-0.0039	-0.0066	0.00000	0.00013	0.00022	-0.00036
100	115.9	1.4482	-0.0015	-0.0199	-0.00001	0.00010	0.00015	-0.00025
120	135.9	1.5174	0.0004	-0.0213	-0.00001	0.00006	0.00009	-0.00015
140	155.9	1.5604	0.0018	-0.0160	0.00001	0.00002	0.00006	-0.00007
160	175.9	1.5879	0.0030	-0.0066	0.00003	-0.00002	0.00003	-0.00001
180	195.9	1.6054	0.0040	0.0050	0.00004	-0.00005	0.00003	0.00002
200	215.9	1.6162	0.0049	0.0180	0.00006	-0.00008	0.00003	0.00004
250	265.9	1.6252	0.0067	0.0527	0.00007	-0.00011	0.00010	0.00001
300	315.9	1.6196	0.0081	0.0876	0.00005	-0.00012	0.00024	-0.00012
350	365.9	1.6064	0.0095	0.1213	0.00001	-0.00009	0.00042	-0.00032
400	415.9	1.5891	0.0108	0.1531	-0.00005	-0.00005	0.00064	-0.00059
450	465.9	1.5696	0.0121	0.1829	-0.00013	0.00001	0.00089	-0.00090
500	515.9	1.5488	0.0135	0.2109	-0.00023	0.00008	0.00116	-0.00124
600	615.9	1.5060	0.0163	0.2620	-0.00045	0.00025	0.00176	-0.00202
700	715.9	1.4636	0.0192	0.3074	-0.00070	0.00044	0.00242	-0.00286
800	815.9	1.4226	0.0223	0.3482	-0.00098	0.00064	0.00312	-0.00376
900	915.9	1.3835	0.0254	0.3852	-0.00128	0.00084	0.00385	-0.00469
1000	1015.9	1.3464	0.0287	0.4190	-0.00159	0.00103	0.00461	-0.00565
1100	1115.9	1.3112	0.0320	0.4503	-0.00192	0.00123	0.00540	-0.00663
1200	1215.9	1.2779	0.0354	0.4792	-0.00226	0.00143	0.00620	-0.00763
1300	1315.9	1.2463	0.0388	0.5063	-0.00261	0.00162	0.00703	-0.00864
1400	1415.9	1.2162	0.0422	0.5316	-0.00297	0.00180	0.00787	-0.00967
1500	1515.9	1.1877	0.0457	0.5554	-0.00334	0.00199	0.00873	-0.01072
1600	1615.9	1.1605	0.0492	0.5778	-0.00372	0.00217	0.00961	-0.01178
1700	1715.9	1.1345	0.0526	0.5990	-0.00412	0.00234	0.01050	-0.01284
1800	1815.9	1.1097	0.0561	0.6190	-0.00451	0.00251	0.01140	-0.01392
1900	1915.9	1.0860	0.0596	0.6380	-0.00492	0.00268	0.01232	-0.01500
2000	2015.9	1.0632	0.0631	0.6560	-0.00534	0.00285	0.01325	-0.01610
2500	2515.9	0.9620	0.0803	0.7337	-0.00751	0.00360	0.01802	-0.02161
3000	3015.9	0.8773	0.0970	0.7952	-0.00981	0.00422	0.02292	-0.02714
3500	3515.9	0.8048	0.1132	0.8444	-0.01221	0.00471	0.02790	-0.03261
4000	4015.9	0.7416	0.1287	0.8844	-0.01462	0.00505	0.03285	-0.03790
4500	4515.9	0.6855	0.1437	0.9168	-0.01711	0.00531	0.03783	-0.04315
5000	5015.9	0.6352	0.1581	0.9432	-0.01960	0.00549	0.04278	-0.04826

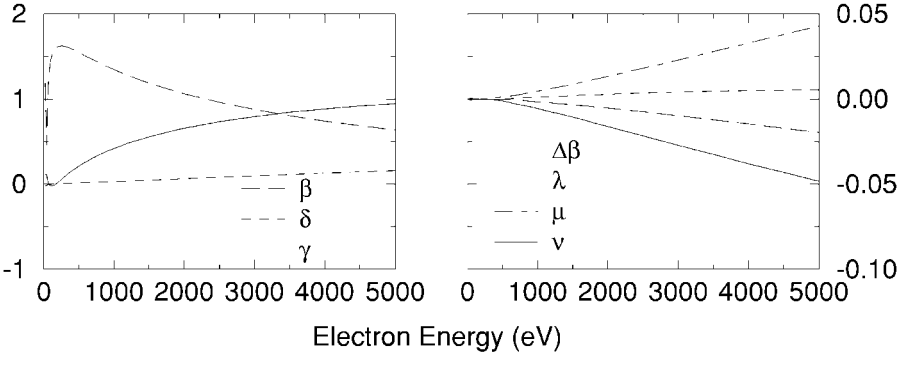

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{3/2}$ shell of Ar $\quad E_b = 15.8$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	35.8	1.1399	-0.0214	0.1157	0.00030	-0.00005	0.00030	-0.00025
40	55.8	0.4683	-0.0146	0.1068	0.00015	0.00019	0.00043	-0.00063
60	75.8	1.0912	-0.0072	0.0265	0.00003	0.00022	0.00024	-0.00046
80	95.8	1.3271	-0.0038	-0.0071	-0.00001	0.00022	0.00013	-0.00035
100	115.8	1.4468	-0.0013	-0.0199	-0.00001	0.00020	0.00004	-0.00024
120	135.8	1.5167	0.0005	-0.0211	-0.00001	0.00017	-0.00003	-0.00015
140	155.8	1.5604	0.0020	-0.0156	0.00001	0.00015	-0.00008	-0.00007
160	175.8	1.5885	0.0032	-0.0062	0.00003	0.00013	-0.00011	-0.00001
180	195.8	1.6066	0.0042	0.0055	0.00004	0.00011	-0.00014	0.00002
200	215.8	1.6179	0.0051	0.0185	0.00005	0.00011	-0.00015	0.00004
250	265.8	1.6280	0.0068	0.0534	0.00007	0.00011	-0.00012	0.00001
300	315.8	1.6231	0.0083	0.0885	0.00005	0.00016	-0.00003	-0.00013
350	365.8	1.6106	0.0096	0.1222	0.00001	0.00023	0.00011	-0.00033
400	415.8	1.5938	0.0109	0.1542	-0.00006	0.00032	0.00028	-0.00060
450	465.8	1.5746	0.0123	0.1842	-0.00014	0.00044	0.00048	-0.00092
500	515.8	1.5541	0.0136	0.2124	-0.00023	0.00057	0.00070	-0.00127
600	615.8	1.5117	0.0163	0.2637	-0.00046	0.00085	0.00120	-0.00205
700	715.8	1.4694	0.0193	0.3093	-0.00071	0.00116	0.00175	-0.00290
800	815.8	1.4285	0.0223	0.3504	-0.00100	0.00148	0.00233	-0.00380
900	915.8	1.3893	0.0255	0.3876	-0.00130	0.00180	0.00294	-0.00474
1000	1015.8	1.3520	0.0287	0.4216	-0.00161	0.00213	0.00358	-0.00571
1100	1115.8	1.3166	0.0320	0.4530	-0.00194	0.00246	0.00424	-0.00670
1200	1215.8	1.2830	0.0354	0.4821	-0.00229	0.00280	0.00491	-0.00771
1300	1315.8	1.2510	0.0388	0.5092	-0.00264	0.00313	0.00561	-0.00873
1400	1415.8	1.2207	0.0423	0.5346	-0.00300	0.00345	0.00632	-0.00977
1500	1515.8	1.1918	0.0457	0.5584	-0.00338	0.00378	0.00704	-0.01083
1600	1615.8	1.1642	0.0492	0.5809	-0.00376	0.00411	0.00778	-0.01189
1700	1715.8	1.1379	0.0527	0.6021	-0.00416	0.00443	0.00854	-0.01297
1800	1815.8	1.1127	0.0562	0.6221	-0.00456	0.00475	0.00930	-0.01405
1900	1915.8	1.0885	0.0597	0.6410	-0.00497	0.00507	0.01007	-0.01514
2000	2015.8	1.0654	0.0633	0.6590	-0.00539	0.00538	0.01086	-0.01624
2500	2515.8	0.9620	0.0807	0.7362	-0.00757	0.00689	0.01489	-0.02179
3000	3015.8	0.8752	0.0978	0.7967	-0.00988	0.00829	0.01904	-0.02732
3500	3515.8	0.8007	0.1144	0.8446	-0.01229	0.00955	0.02324	-0.03279
4000	4015.8	0.7355	0.1304	0.8829	-0.01470	0.01067	0.02740	-0.03806
4500	4515.8	0.6777	0.1459	0.9134	-0.01719	0.01169	0.03157	-0.04326
5000	5015.8	0.6258	0.1610	0.9375	-0.01968	0.01262	0.03567	-0.04829

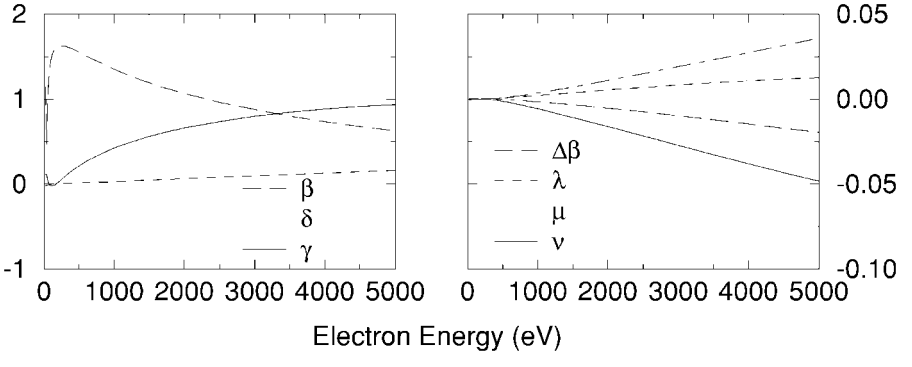

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$1s$ shell of Kr $E_b = 14327.1$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	14347.1	1.9906	-0.7718	0.00267	0.00281	0.00375	-0.00656
40	14367.1	1.9906	-0.8252	0.00236	0.00300	0.00403	-0.00703
60	14387.1	1.9905	-0.7997	0.00213	0.00315	0.00424	-0.00739
80	14407.1	1.9905	-0.7636	0.00209	0.00321	0.00432	-0.00753
100	14427.1	1.9904	-0.7267	0.00218	0.00319	0.00431	-0.00750
120	14447.1	1.9903	-0.6912	0.00235	0.00314	0.00424	-0.00738
140	14467.1	1.9903	-0.6577	0.00258	0.00306	0.00413	-0.00719
160	14487.1	1.9902	-0.6261	0.00284	0.00297	0.00399	-0.00696
180	14507.1	1.9901	-0.5964	0.00312	0.00286	0.00385	-0.00671
200	14527.1	1.9900	-0.5683	0.00341	0.00275	0.00369	-0.00644
250	14577.1	1.9897	-0.5041	0.00417	0.00247	0.00329	-0.00576
300	14627.1	1.9895	-0.4470	0.00492	0.00220	0.00291	-0.00511
350	14677.1	1.9892	-0.3954	0.00563	0.00196	0.00257	-0.00452
400	14727.1	1.9889	-0.3481	0.00629	0.00175	0.00227	-0.00402
450	14777.1	1.9887	-0.3044	0.00688	0.00157	0.00202	-0.00359
500	14827.1	1.9884	-0.2636	0.00743	0.00143	0.00182	-0.00325
600	14927.1	1.9878	-0.1891	0.00836	0.00123	0.00153	-0.00277
700	15027.1	1.9872	-0.1221	0.00912	0.00114	0.00139	-0.00252
800	15127.1	1.9867	-0.0609	0.00974	0.00112	0.00135	-0.00247
900	15227.1	1.9861	-0.0043	0.01025	0.00116	0.00141	-0.00257
1000	15327.1	1.9855	0.0485	0.01066	0.00126	0.00153	-0.00279
1100	15427.1	1.9849	0.0980	0.01101	0.00139	0.00171	-0.00311
1200	15527.1	1.9843	0.1448	0.01129	0.00156	0.00194	-0.00351
1300	15627.1	1.9837	0.1893	0.01153	0.00176	0.00221	-0.00398
1400	15727.1	1.9831	0.2316	0.01171	0.00199	0.00252	-0.00450
1500	15827.1	1.9825	0.2721	0.01186	0.00223	0.00285	-0.00508
1600	15927.1	1.9820	0.3109	0.01198	0.00249	0.00321	-0.00571
1700	16027.1	1.9814	0.3482	0.01207	0.00277	0.00359	-0.00637
1800	16127.1	1.9808	0.3842	0.01213	0.00307	0.00400	-0.00706
1900	16227.1	1.9802	0.4189	0.01217	0.00337	0.00442	-0.00779
2000	16327.1	1.9796	0.4526	0.01219	0.00369	0.00485	-0.00855
2500	16827.1	1.9766	0.6067	0.01204	0.00542	0.00723	-0.01265
3000	17327.1	1.9737	0.7425	0.01158	0.00732	0.00984	-0.01716
3500	17827.1	1.9707	0.8647	0.01091	0.00934	0.01261	-0.02195
4000	18327.1	1.9677	0.9764	0.01008	0.01144	0.01551	-0.02695
4500	18827.1	1.9647	1.0796	0.00912	0.01361	0.01850	-0.03211
5000	19327.1	1.9618	1.1758	0.00807	0.01583	0.02155	-0.03738

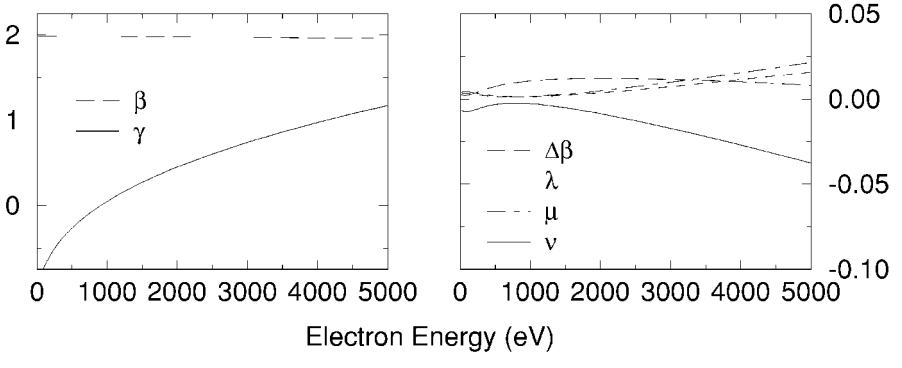

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2s$ shell of Kr $E_b = 1920.4$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	1940.4	1.9841	1.0228	0.00491	0.00466	0.00662	-0.01128
40	1960.4	1.9845	1.0722	0.00577	0.00393	0.00559	-0.00952
60	1980.4	1.9850	1.0188	0.00636	0.00336	0.00480	-0.00816
80	2000.4	1.9854	0.9537	0.00638	0.00313	0.00448	-0.00762
100	2020.4	1.9858	0.8899	0.00602	0.00313	0.00448	-0.00761
120	2040.4	1.9861	0.8300	0.00545	0.00326	0.00466	-0.00792
140	2060.4	1.9865	0.7744	0.00474	0.00347	0.00495	-0.00842
160	2080.4	1.9868	0.7229	0.00396	0.00373	0.00532	-0.00904
180	2100.4	1.9871	0.6752	0.00315	0.00402	0.00572	-0.00974
200	2120.4	1.9874	0.6309	0.00231	0.00432	0.00614	-0.01046
250	2170.4	1.9882	0.5331	0.00028	0.00507	0.00720	-0.01227
300	2220.4	1.9888	0.4503	-0.00158	0.00576	0.00816	-0.01393
350	2270.4	1.9894	0.3795	-0.00321	0.00635	0.00898	-0.01533
400	2320.4	1.9900	0.3183	-0.00460	0.00682	0.00964	-0.01646
450	2370.4	1.9905	0.2652	-0.00576	0.00718	0.01015	-0.01733
500	2420.4	1.9911	0.2188	-0.00672	0.00745	0.01052	-0.01797
600	2520.4	1.9920	0.1424	-0.00812	0.00773	0.01092	-0.01865
700	2620.4	1.9928	0.0834	-0.00898	0.00778	0.01097	-0.01875
800	2720.4	1.9936	0.0377	-0.00946	0.00765	0.01079	-0.01844
900	2820.4	1.9943	0.0027	-0.00966	0.00740	0.01045	-0.01785
1000	2920.4	1.9949	-0.0239	-0.00966	0.00709	0.01000	-0.01709
1100	3020.4	1.9954	-0.0435	-0.00952	0.00673	0.00949	-0.01622
1200	3120.4	1.9959	-0.0575	-0.00927	0.00634	0.00895	-0.01529
1300	3220.4	1.9963	-0.0666	-0.00894	0.00594	0.00838	-0.01432
1400	3320.4	1.9967	-0.0717	-0.00857	0.00554	0.00782	-0.01335
1500	3420.4	1.9970	-0.0735	-0.00815	0.00514	0.00726	-0.01240
1600	3520.4	1.9973	-0.0724	-0.00771	0.00475	0.00671	-0.01146
1700	3620.4	1.9975	-0.0689	-0.00726	0.00437	0.00618	-0.01056
1800	3720.4	1.9977	-0.0633	-0.00680	0.00401	0.00568	-0.00969
1900	3820.4	1.9979	-0.0559	-0.00633	0.00367	0.00519	-0.00887
2000	3920.4	1.9980	-0.0470	-0.00586	0.00335	0.00474	-0.00809
2500	4420.4	1.9982	0.0144	-0.00365	0.00202	0.00287	-0.00489
3000	4920.4	1.9979	0.0924	-0.00174	0.00117	0.00165	-0.00282
3500	5420.4	1.9971	0.1783	-0.00017	0.00074	0.00102	-0.00176
4000	5920.4	1.9960	0.2673	0.00108	0.00066	0.00089	-0.00154
4500	6420.4	1.9946	0.3569	0.00204	0.00088	0.00117	-0.00205
5000	6920.4	1.9931	0.4457	0.00274	0.00135	0.00181	-0.00316

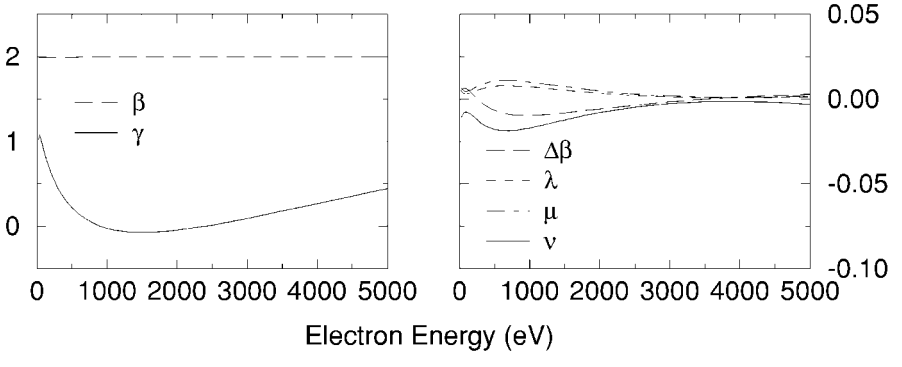

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{1/2}$ shell of Kr $\quad E_b = 1730.9$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	1750.9	0.5989	0.0193	-0.1142	0.00014	-0.00178	0.00044	0.00134
40	1770.9	0.7223	0.0154	-0.1342	0.00022	-0.00163	0.00043	0.00119
60	1790.9	0.8235	0.0108	-0.1483	0.00031	-0.00150	0.00043	0.00107
80	1810.9	0.9017	0.0080	-0.1591	0.00039	-0.00143	0.00041	0.00102
100	1830.9	0.9640	0.0063	-0.1668	0.00048	-0.00140	0.00038	0.00102
120	1850.9	1.0154	0.0055	-0.1718	0.00057	-0.00140	0.00035	0.00105
140	1870.9	1.0586	0.0051	-0.1747	0.00066	-0.00143	0.00032	0.00111
160	1890.9	1.0957	0.0051	-0.1757	0.00075	-0.00146	0.00028	0.00118
180	1910.9	1.1279	0.0053	-0.1749	0.00084	-0.00151	0.00025	0.00126
200	1930.9	1.1562	0.0056	-0.1727	0.00093	-0.00156	0.00022	0.00134
250	1980.9	1.2138	0.0071	-0.1617	0.00116	-0.00171	0.00015	0.00155
300	2030.9	1.2580	0.0088	-0.1447	0.00139	-0.00186	0.00011	0.00175
350	2080.9	1.2928	0.0107	-0.1236	0.00160	-0.00202	0.00010	0.00192
400	2130.9	1.3207	0.0126	-0.0998	0.00180	-0.00215	0.00011	0.00205
450	2180.9	1.3433	0.0144	-0.0744	0.00199	-0.00228	0.00014	0.00214
500	2230.9	1.3619	0.0160	-0.0481	0.00216	-0.00238	0.00020	0.00218
600	2330.9	1.3900	0.0191	0.0052	0.00245	-0.00255	0.00038	0.00216
700	2430.9	1.4093	0.0217	0.0577	0.00268	-0.00265	0.00065	0.00200
800	2530.9	1.4227	0.0240	0.1082	0.00284	-0.00269	0.00099	0.00170
900	2630.9	1.4316	0.0261	0.1565	0.00294	-0.00269	0.00139	0.00129
1000	2730.9	1.4373	0.0280	0.2025	0.00298	-0.00264	0.00186	0.00079
1100	2830.9	1.4404	0.0298	0.2462	0.00298	-0.00256	0.00237	0.00020
1200	2930.9	1.4417	0.0314	0.2878	0.00293	-0.00245	0.00292	-0.00047
1300	3030.9	1.4414	0.0330	0.3274	0.00285	-0.00232	0.00352	-0.00120
1400	3130.9	1.4399	0.0346	0.3651	0.00273	-0.00216	0.00415	-0.00198
1500	3230.9	1.4374	0.0361	0.4012	0.00258	-0.00199	0.00480	-0.00281
1600	3330.9	1.4341	0.0376	0.4358	0.00240	-0.00180	0.00549	-0.00369
1700	3430.9	1.4302	0.0391	0.4689	0.00221	-0.00159	0.00620	-0.00460
1800	3530.9	1.4257	0.0406	0.5007	0.00199	-0.00138	0.00692	-0.00555
1900	3630.9	1.4207	0.0420	0.5312	0.00175	-0.00115	0.00767	-0.00652
2000	3730.9	1.4154	0.0435	0.5606	0.00150	-0.00092	0.00844	-0.00752
2500	4230.9	1.3851	0.0508	0.6929	0.00004	0.00034	0.01245	-0.01280
3000	4730.9	1.3516	0.0582	0.8054	-0.00165	0.00168	0.01670	-0.01838
3500	5230.9	1.3172	0.0657	0.9028	-0.00350	0.00304	0.02109	-0.02413
4000	5730.9	1.2830	0.0734	0.9882	-0.00544	0.00438	0.02557	-0.02996
4500	6230.9	1.2495	0.0811	1.0639	-0.00746	0.00569	0.03012	-0.03581
5000	6730.9	1.2170	0.0889	1.1315	-0.00954	0.00695	0.03470	-0.04165

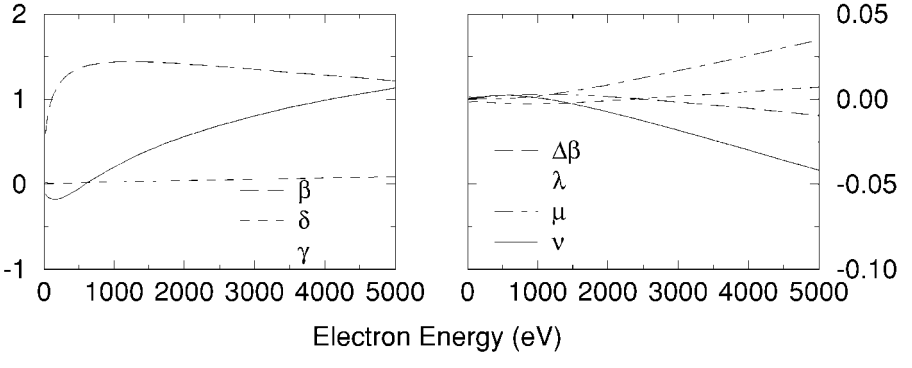

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{3/2}$ shell of Kr $\quad E_b = 1679.1$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	1699.1	0.5732	0.0190	-0.1109	0.00013	0.00107	-0.00233	0.00127
40	1719.1	0.7017	0.0152	-0.1324	0.00021	0.00110	-0.00222	0.00111
60	1739.1	0.8078	0.0107	-0.1477	0.00030	0.00114	-0.00213	0.00099
80	1759.1	0.8900	0.0080	-0.1596	0.00038	0.00114	-0.00207	0.00093
100	1779.1	0.9558	0.0066	-0.1681	0.00047	0.00112	-0.00205	0.00093
120	1799.1	1.0100	0.0059	-0.1739	0.00056	0.00108	-0.00204	0.00096
140	1819.1	1.0558	0.0056	-0.1775	0.00065	0.00103	-0.00204	0.00101
160	1839.1	1.0950	0.0057	-0.1790	0.00075	0.00097	-0.00205	0.00108
180	1859.1	1.1292	0.0060	-0.1787	0.00084	0.00091	-0.00206	0.00116
200	1879.1	1.1593	0.0065	-0.1769	0.00094	0.00084	-0.00208	0.00124
250	1929.1	1.2206	0.0082	-0.1665	0.00117	0.00067	-0.00212	0.00145
300	1979.1	1.2678	0.0101	-0.1498	0.00139	0.00051	-0.00215	0.00165
350	2029.1	1.3051	0.0121	-0.1287	0.00161	0.00036	-0.00217	0.00181
400	2079.1	1.3351	0.0141	-0.1047	0.00181	0.00023	-0.00217	0.00194
450	2129.1	1.3595	0.0159	-0.0790	0.00200	0.00012	-0.00215	0.00203
500	2179.1	1.3796	0.0176	-0.0522	0.00218	0.00003	-0.00211	0.00208
600	2279.1	1.4102	0.0206	0.0022	0.00247	-0.00008	-0.00197	0.00205
700	2379.1	1.4315	0.0232	0.0559	0.00269	-0.00011	-0.00176	0.00188
800	2479.1	1.4464	0.0255	0.1078	0.00285	-0.00008	-0.00148	0.00157
900	2579.1	1.4566	0.0275	0.1575	0.00295	0.00000	-0.00114	0.00114
1000	2679.1	1.4633	0.0293	0.2048	0.00299	0.00013	-0.00075	0.00062
1100	2779.1	1.4673	0.0309	0.2498	0.00298	0.00031	-0.00031	0.00000
1200	2879.1	1.4692	0.0325	0.2926	0.00292	0.00051	0.00017	-0.00069
1300	2979.1	1.4695	0.0340	0.3335	0.00283	0.00075	0.00069	-0.00144
1400	3079.1	1.4685	0.0354	0.3724	0.00270	0.00101	0.00125	-0.00226
1500	3179.1	1.4664	0.0369	0.4097	0.00254	0.00130	0.00183	-0.00313
1600	3279.1	1.4634	0.0382	0.4453	0.00235	0.00160	0.00244	-0.00404
1700	3379.1	1.4597	0.0396	0.4795	0.00214	0.00192	0.00307	-0.00499
1800	3479.1	1.4553	0.0410	0.5123	0.00191	0.00225	0.00372	-0.00597
1900	3579.1	1.4505	0.0424	0.5439	0.00166	0.00260	0.00438	-0.00698
2000	3679.1	1.4453	0.0437	0.5743	0.00140	0.00296	0.00507	-0.00802
2500	4179.1	1.4148	0.0507	0.7108	-0.00013	0.00485	0.00866	-0.01352
3000	4679.1	1.3805	0.0578	0.8267	-0.00189	0.00686	0.01248	-0.01933
3500	5179.1	1.3449	0.0652	0.9268	-0.00381	0.00890	0.01642	-0.02531
4000	5679.1	1.3092	0.0727	1.0144	-0.00582	0.01093	0.02044	-0.03137
4500	6179.1	1.2741	0.0805	1.0917	-0.00791	0.01294	0.02451	-0.03744
5000	6679.1	1.2398	0.0883	1.1605	-0.01005	0.01490	0.02860	-0.04350

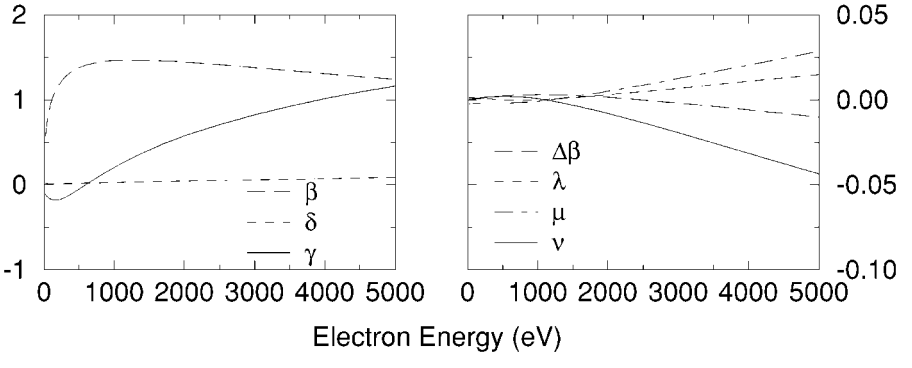

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3s$ shell of Kr $E_b = 293.1$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	313.1	1.9911	0.3118	0.00025	0.00053	0.00078	-0.00132
40	333.1	1.9914	0.3773	-0.00086	0.00135	0.00193	-0.00327
60	353.1	1.9918	0.3989	-0.00138	0.00181	0.00257	-0.00439
80	373.1	1.9920	0.4060	-0.00120	0.00186	0.00265	-0.00451
100	393.1	1.9922	0.4054	-0.00070	0.00172	0.00244	-0.00416
120	413.1	1.9923	0.4000	-0.00010	0.00151	0.00215	-0.00365
140	433.1	1.9924	0.3915	0.00047	0.00129	0.00184	-0.00313
160	453.1	1.9925	0.3809	0.00099	0.00109	0.00156	-0.00265
180	473.1	1.9926	0.3689	0.00142	0.00092	0.00133	-0.00225
200	493.1	1.9927	0.3560	0.00177	0.00079	0.00115	-0.00194
250	543.1	1.9928	0.3215	0.00230	0.00062	0.00090	-0.00152
300	593.1	1.9930	0.2865	0.00244	0.00062	0.00091	-0.00152
350	643.1	1.9931	0.2523	0.00229	0.00074	0.00108	-0.00182
400	693.1	1.9933	0.2198	0.00197	0.00094	0.00135	-0.00229
450	743.1	1.9934	0.1892	0.00154	0.00117	0.00168	-0.00285
500	793.1	1.9936	0.1608	0.00107	0.00141	0.00202	-0.00344
600	893.1	1.9939	0.1101	0.00008	0.00188	0.00268	-0.00457
700	993.1	1.9942	0.0673	-0.00084	0.00228	0.00324	-0.00553
800	1093.1	1.9946	0.0317	-0.00163	0.00259	0.00368	-0.00627
900	1193.1	1.9949	0.0023	-0.00229	0.00281	0.00399	-0.00680
1000	1293.1	1.9953	-0.0215	-0.00281	0.00295	0.00418	-0.00714
1100	1393.1	1.9956	-0.0404	-0.00321	0.00303	0.00429	-0.00732
1200	1493.1	1.9959	-0.0550	-0.00351	0.00305	0.00431	-0.00736
1300	1593.1	1.9962	-0.0659	-0.00371	0.00302	0.00428	-0.00730
1400	1693.1	1.9965	-0.0734	-0.00384	0.00296	0.00419	-0.00714
1500	1793.1	1.9968	-0.0780	-0.00391	0.00287	0.00406	-0.00692
1600	1893.1	1.9970	-0.0800	-0.00391	0.00275	0.00390	-0.00665
1700	1993.1	1.9972	-0.0797	-0.00387	0.00262	0.00371	-0.00633
1800	2093.1	1.9974	-0.0773	-0.00379	0.00248	0.00351	-0.00599
1900	2193.1	1.9976	-0.0731	-0.00368	0.00233	0.00330	-0.00563
2000	2293.1	1.9977	-0.0674	-0.00353	0.00217	0.00309	-0.00526
2500	2793.1	1.9982	-0.0201	-0.00256	0.00142	0.00202	-0.00344
3000	3293.1	1.9981	0.0473	-0.00140	0.00082	0.00117	-0.00199
3500	3793.1	1.9977	0.1256	-0.00027	0.00046	0.00065	-0.00112
4000	4293.1	1.9968	0.2091	0.00073	0.00036	0.00049	-0.00085
4500	4793.1	1.9958	0.2948	0.00156	0.00050	0.00067	-0.00117
5000	5293.1	1.9944	0.3808	0.00221	0.00086	0.00116	-0.00202

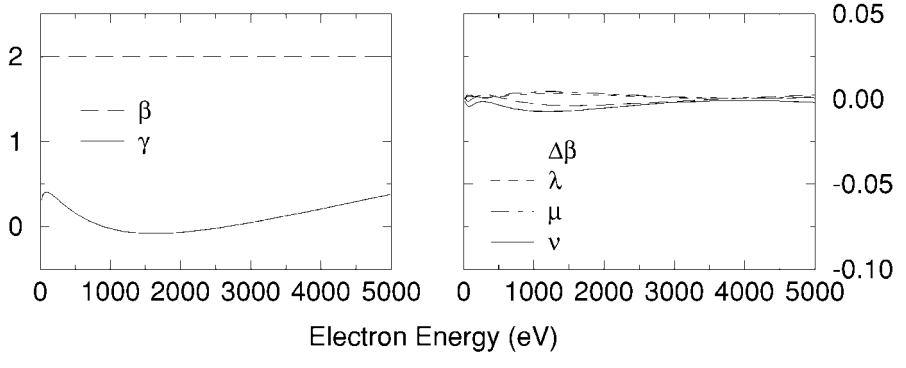

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{1/2}$ shell of Kr $\quad E_b = 222.4$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	242.4	-0.7318	0.0598	-0.1495	-0.00004	-0.00087	0.00033	0.00054
40	262.4	-0.1501	0.0899	-0.1390	0.00025	-0.00154	0.00043	0.00110
60	282.4	0.2728	0.0869	-0.0084	0.00042	-0.00180	0.00074	0.00106
80	302.4	0.5643	0.0715	0.1042	0.00041	-0.00170	0.00107	0.00062
100	322.4	0.7718	0.0562	0.1722	0.00030	-0.00146	0.00138	0.00008
120	342.4	0.9247	0.0438	0.2060	0.00013	-0.00118	0.00164	-0.00046
140	362.4	1.0411	0.0340	0.2175	-0.00005	-0.00091	0.00185	-0.00095
160	382.4	1.1320	0.0265	0.2150	-0.00023	-0.00065	0.00202	-0.00136
180	402.4	1.2045	0.0207	0.2040	-0.00040	-0.00043	0.00214	-0.00171
200	422.4	1.2634	0.0162	0.1882	-0.00056	-0.00024	0.00222	-0.00199
250	472.4	1.3704	0.0087	0.1406	-0.00089	0.00013	0.00232	-0.00245
300	522.4	1.4409	0.0045	0.0941	-0.00113	0.00035	0.00230	-0.00266
350	572.4	1.4897	0.0022	0.0551	-0.00130	0.00047	0.00222	-0.00269
400	622.4	1.5244	0.0010	0.0249	-0.00139	0.00052	0.00209	-0.00261
450	672.4	1.5498	0.0003	0.0031	-0.00144	0.00051	0.00194	-0.00246
500	722.4	1.5684	0.0001	-0.0114	-0.00144	0.00047	0.00178	-0.00226
600	822.4	1.5922	0.0004	-0.0232	-0.00135	0.00033	0.00147	-0.00180
700	922.4	1.6045	0.0011	-0.0184	-0.00117	0.00015	0.00120	-0.00134
800	1022.4	1.6098	0.0019	-0.0029	-0.00095	-0.00004	0.00097	-0.00093
900	1122.4	1.6104	0.0029	0.0195	-0.00071	-0.00022	0.00081	-0.00059
1000	1222.4	1.6079	0.0039	0.0464	-0.00048	-0.00038	0.00072	-0.00034
1100	1322.4	1.6033	0.0049	0.0760	-0.00026	-0.00050	0.00068	-0.00018
1200	1422.4	1.5971	0.0060	0.1073	-0.00005	-0.00060	0.00072	-0.00011
1300	1522.4	1.5898	0.0071	0.1396	0.00013	-0.00067	0.00081	-0.00014
1400	1622.4	1.5817	0.0082	0.1722	0.00028	-0.00071	0.00096	-0.00025
1500	1722.4	1.5730	0.0094	0.2049	0.00040	-0.00072	0.00116	-0.00045
1600	1822.4	1.5638	0.0105	0.2373	0.00050	-0.00070	0.00142	-0.00072
1700	1922.4	1.5543	0.0117	0.2694	0.00057	-0.00066	0.00172	-0.00106
1800	2022.4	1.5445	0.0130	0.3010	0.00061	-0.00059	0.00207	-0.00147
1900	2122.4	1.5346	0.0142	0.3321	0.00063	-0.00050	0.00245	-0.00195
2000	2222.4	1.5246	0.0155	0.3624	0.00062	-0.00040	0.00288	-0.00248
2500	2722.4	1.4742	0.0223	0.5039	0.00025	0.00038	0.00547	-0.00586
3000	3222.4	1.4248	0.0297	0.6282	-0.00057	0.00143	0.00867	-0.01011
3500	3722.4	1.3777	0.0375	0.7369	-0.00171	0.00264	0.01228	-0.01492
4000	4222.4	1.3330	0.0455	0.8324	-0.00310	0.00391	0.01616	-0.02006
4500	4722.4	1.2909	0.0538	0.9166	-0.00467	0.00519	0.02022	-0.02541
5000	5222.4	1.2513	0.0621	0.9915	-0.00637	0.00645	0.02441	-0.03086

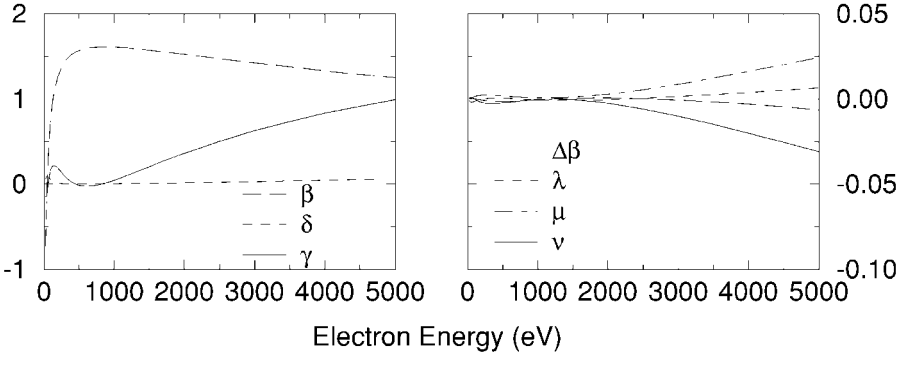

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{3/2}$ shell of Kr $\quad E_b = 214.8$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	234.8	-0.7044	0.0561	-0.1375	-0.00003	-0.00042	-0.00007	0.00049
40	254.8	-0.1379	0.0849	-0.1270	0.00022	-0.00103	0.00004	0.00099
60	274.8	0.2742	0.0825	-0.0065	0.00036	-0.00129	0.00033	0.00096
80	294.8	0.5594	0.0682	0.0977	0.00034	-0.00122	0.00064	0.00058
100	314.8	0.7636	0.0538	0.1609	0.00022	-0.00101	0.00093	0.00008
120	334.8	0.9150	0.0419	0.1923	0.00005	-0.00076	0.00117	-0.00041
140	354.8	1.0310	0.0326	0.2028	-0.00013	-0.00050	0.00136	-0.00086
160	374.8	1.1222	0.0254	0.2003	-0.00030	-0.00026	0.00151	-0.00125
180	394.8	1.1953	0.0198	0.1898	-0.00047	-0.00004	0.00161	-0.00158
200	414.8	1.2551	0.0154	0.1746	-0.00062	0.00016	0.00169	-0.00184
250	464.8	1.3647	0.0082	0.1291	-0.00093	0.00053	0.00175	-0.00229
300	514.8	1.4380	0.0043	0.0847	-0.00116	0.00078	0.00170	-0.00249
350	564.8	1.4894	0.0022	0.0474	-0.00130	0.00094	0.00159	-0.00253
400	614.8	1.5266	0.0012	0.0187	-0.00139	0.00102	0.00143	-0.00246
450	664.8	1.5541	0.0008	-0.0018	-0.00142	0.00106	0.00125	-0.00232
500	714.8	1.5747	0.0007	-0.0153	-0.00141	0.00106	0.00107	-0.00213
600	814.8	1.6019	0.0013	-0.0252	-0.00131	0.00101	0.00070	-0.00170
700	914.8	1.6171	0.0021	-0.0191	-0.00112	0.00091	0.00036	-0.00127
800	1014.8	1.6247	0.0031	-0.0023	-0.00090	0.00082	0.00007	-0.00089
900	1114.8	1.6273	0.0042	0.0212	-0.00066	0.00073	-0.00016	-0.00057
1000	1214.8	1.6265	0.0052	0.0491	-0.00043	0.00067	-0.00032	-0.00035
1100	1314.8	1.6232	0.0063	0.0798	-0.00021	0.00064	-0.00042	-0.00022
1200	1414.8	1.6183	0.0074	0.1120	-0.00001	0.00064	-0.00046	-0.00018
1300	1514.8	1.6120	0.0085	0.1452	0.00016	0.00067	-0.00044	-0.00023
1400	1614.8	1.6047	0.0096	0.1787	0.00030	0.00074	-0.00036	-0.00038
1500	1714.8	1.5967	0.0107	0.2123	0.00042	0.00083	-0.00023	-0.00060
1600	1814.8	1.5882	0.0118	0.2456	0.00050	0.00096	-0.00005	-0.00091
1700	1914.8	1.5793	0.0130	0.2786	0.00056	0.00111	0.00018	-0.00129
1800	2014.8	1.5700	0.0142	0.3110	0.00059	0.00128	0.00045	-0.00173
1900	2114.8	1.5605	0.0154	0.3428	0.00059	0.00148	0.00076	-0.00224
2000	2214.8	1.5508	0.0166	0.3740	0.00057	0.00171	0.00110	-0.00281
2500	2714.8	1.5011	0.0231	0.5192	0.00013	0.00308	0.00330	-0.00638
3000	3214.8	1.4517	0.0302	0.6465	-0.00076	0.00476	0.00608	-0.01084
3500	3714.8	1.4038	0.0378	0.7578	-0.00198	0.00661	0.00925	-0.01586
4000	4214.8	1.3580	0.0457	0.8553	-0.00344	0.00855	0.01267	-0.02122
4500	4714.8	1.3146	0.0539	0.9412	-0.00508	0.01052	0.01626	-0.02678
5000	5214.8	1.2733	0.0622	1.0172	-0.00686	0.01247	0.01996	-0.03243

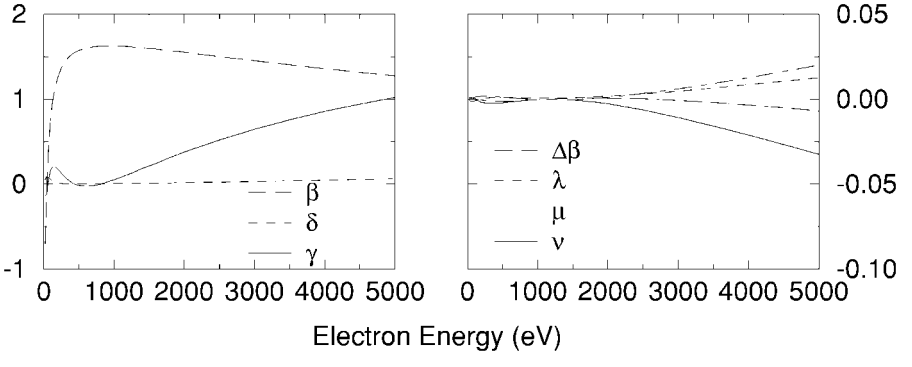

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3d_{3/2}$ shell of Kr $\quad E_b = 95.4$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	115.4	0.3185	0.0064	-0.0003	0.00000	0.00002	-0.00004	0.00002
40	135.4	0.0302	0.0084	-0.0102	-0.00001	-0.00001	-0.00004	0.00004
60	155.4	0.1802	0.0106	-0.0127	-0.00001	-0.00002	-0.00003	0.00006
80	175.4	0.3458	0.0129	-0.0124	-0.00001	-0.00004	-0.00003	0.00007
100	195.4	0.4845	0.0151	-0.0102	-0.00001	-0.00006	-0.00001	0.00007
120	215.4	0.5971	0.0172	-0.0065	-0.00001	-0.00008	0.00001	0.00007
140	235.4	0.6889	0.0191	-0.0017	-0.00001	-0.00010	0.00003	0.00007
160	255.4	0.7647	0.0208	0.0038	-0.00002	-0.00012	0.00006	0.00006
180	275.4	0.8279	0.0223	0.0098	-0.00002	-0.00014	0.00009	0.00005
200	295.4	0.8812	0.0237	0.0162	-0.00003	-0.00017	0.00013	0.00003
250	345.4	0.9827	0.0268	0.0334	-0.00006	-0.00022	0.00024	-0.00003
300	395.4	1.0528	0.0294	0.0517	-0.00009	-0.00026	0.00038	-0.00012
350	445.4	1.1025	0.0318	0.0709	-0.00012	-0.00031	0.00054	-0.00023
400	495.4	1.1380	0.0341	0.0909	-0.00016	-0.00035	0.00072	-0.00037
450	545.4	1.1633	0.0363	0.1114	-0.00020	-0.00039	0.00092	-0.00054
500	595.4	1.1812	0.0384	0.1326	-0.00024	-0.00042	0.00115	-0.00073
600	695.4	1.2013	0.0426	0.1759	-0.00035	-0.00048	0.00167	-0.00119
700	795.4	1.2076	0.0467	0.2200	-0.00048	-0.00051	0.00228	-0.00177
800	895.4	1.2053	0.0510	0.2640	-0.00065	-0.00053	0.00298	-0.00244
900	995.4	1.1975	0.0552	0.3073	-0.00085	-0.00053	0.00375	-0.00323
1000	1095.4	1.1859	0.0596	0.3494	-0.00109	-0.00050	0.00460	-0.00410
1100	1195.4	1.1719	0.0640	0.3901	-0.00136	-0.00045	0.00552	-0.00507
1200	1295.4	1.1563	0.0684	0.4290	-0.00167	-0.00039	0.00650	-0.00611
1300	1395.4	1.1396	0.0729	0.4662	-0.00202	-0.00031	0.00753	-0.00723
1400	1495.4	1.1222	0.0774	0.5015	-0.00241	-0.00022	0.00862	-0.00840
1500	1595.4	1.1045	0.0820	0.5351	-0.00283	-0.00011	0.00975	-0.00964
1600	1695.4	1.0866	0.0866	0.5668	-0.00328	0.00000	0.01091	-0.01091
1700	1795.4	1.0687	0.0912	0.5968	-0.00377	0.00011	0.01211	-0.01223
1800	1895.4	1.0510	0.0958	0.6250	-0.00428	0.00023	0.01334	-0.01358
1900	1995.4	1.0333	0.1005	0.6517	-0.00481	0.00035	0.01459	-0.01495
2000	2095.4	1.0160	0.1051	0.6769	-0.00537	0.00047	0.01587	-0.01634
2500	2595.4	0.9341	0.1283	0.7823	-0.00847	0.00099	0.02244	-0.02343
3000	3095.4	0.8616	0.1512	0.8605	-0.01189	0.00130	0.02915	-0.03045
3500	3595.4	0.7983	0.1736	0.9190	-0.01550	0.00134	0.03584	-0.03718
4000	4095.4	0.7432	0.1953	0.9634	-0.01921	0.00110	0.04243	-0.04354
4500	4595.4	0.6952	0.2164	0.9975	-0.02294	0.00060	0.04891	-0.04951
5000	5095.4	0.6533	0.2369	1.0241	-0.02668	-0.00013	0.05526	-0.05512

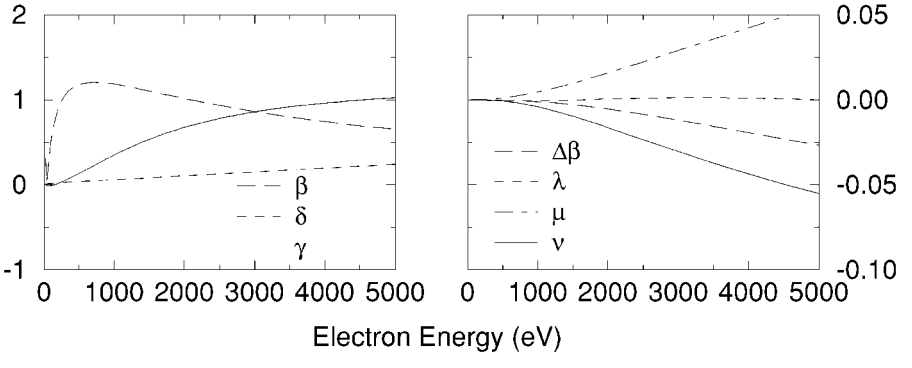

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3d_{5/2}$ shell of Kr $\quad E_b = 94.2$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	114.2	0.2690	0.0067	-0.0010	0.00000	0.00012	-0.00013	0.00002
40	134.2	0.0260	0.0086	-0.0106	-0.00001	0.00016	-0.00021	0.00004
60	154.2	0.1922	0.0107	-0.0128	-0.00001	0.00018	-0.00023	0.00006
80	174.2	0.3635	0.0129	-0.0122	-0.00001	0.00018	-0.00025	0.00007
100	194.2	0.5039	0.0151	-0.0097	-0.00001	0.00018	-0.00025	0.00007
120	214.2	0.6166	0.0172	-0.0058	-0.00001	0.00018	-0.00025	0.00007
140	234.2	0.7078	0.0190	-0.0008	-0.00001	0.00018	-0.00025	0.00007
160	254.2	0.7826	0.0207	0.0049	-0.00002	0.00018	-0.00024	0.00006
180	274.2	0.8446	0.0222	0.0112	-0.00002	0.00017	-0.00022	0.00005
200	294.2	0.8966	0.0236	0.0177	-0.00003	0.00017	-0.00020	0.00003
250	344.2	0.9946	0.0266	0.0352	-0.00006	0.00017	-0.00014	-0.00004
300	394.2	1.0614	0.0293	0.0538	-0.00009	0.00018	-0.00005	-0.00013
350	444.2	1.1079	0.0317	0.0731	-0.00012	0.00018	0.00006	-0.00025
400	494.2	1.1406	0.0340	0.0932	-0.00016	0.00020	0.00020	-0.00039
450	544.2	1.1634	0.0362	0.1138	-0.00020	0.00021	0.00035	-0.00056
500	594.2	1.1789	0.0383	0.1349	-0.00025	0.00023	0.00053	-0.00076
600	694.2	1.1951	0.0426	0.1782	-0.00036	0.00028	0.00095	-0.00123
700	794.2	1.1982	0.0470	0.2220	-0.00050	0.00035	0.00146	-0.00181
800	894.2	1.1933	0.0513	0.2656	-0.00066	0.00044	0.00206	-0.00250
900	994.2	1.1833	0.0558	0.3085	-0.00087	0.00055	0.00273	-0.00328
1000	1094.2	1.1700	0.0603	0.3501	-0.00111	0.00068	0.00348	-0.00416
1100	1194.2	1.1546	0.0650	0.3902	-0.00138	0.00084	0.00429	-0.00513
1200	1294.2	1.1378	0.0696	0.4286	-0.00170	0.00101	0.00517	-0.00618
1300	1394.2	1.1201	0.0743	0.4653	-0.00206	0.00119	0.00610	-0.00730
1400	1494.2	1.1019	0.0791	0.5001	-0.00245	0.00139	0.00708	-0.00847
1500	1594.2	1.0835	0.0839	0.5331	-0.00287	0.00160	0.00811	-0.00971
1600	1694.2	1.0651	0.0887	0.5643	-0.00333	0.00181	0.00917	-0.01098
1700	1794.2	1.0468	0.0935	0.5938	-0.00382	0.00203	0.01027	-0.01230
1800	1894.2	1.0287	0.0984	0.6217	-0.00434	0.00225	0.01139	-0.01365
1900	1994.2	1.0108	0.1032	0.6479	-0.00488	0.00248	0.01254	-0.01502
2000	2094.2	0.9932	0.1081	0.6726	-0.00545	0.00270	0.01371	-0.01641
2500	2594.2	0.9111	0.1323	0.7764	-0.00858	0.00373	0.01977	-0.02350
3000	3094.2	0.8392	0.1561	0.8535	-0.01206	0.00455	0.02597	-0.03052
3500	3594.2	0.7768	0.1793	0.9114	-0.01572	0.00510	0.03216	-0.03726
4000	4094.2	0.7229	0.2018	0.9555	-0.01948	0.00537	0.03827	-0.04364
4500	4594.2	0.6762	0.2235	0.9896	-0.02328	0.00537	0.04427	-0.04964
5000	5094.2	0.6357	0.2446	1.0166	-0.02709	0.00514	0.05015	-0.05529

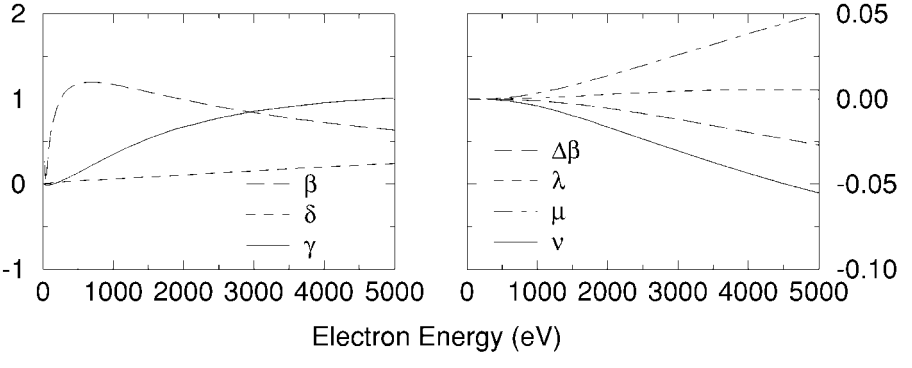

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4s$ shell of Kr $E_b = 27.5$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	47.5	1.9439	-0.2953	0.00062	0.00027	0.00040	-0.00067
40	67.5	1.9817	-0.0121	0.00046	-0.00026	-0.00035	0.00061
60	87.5	1.9886	0.0990	0.00012	-0.00001	0.00000	0.00001
80	107.5	1.9911	0.1590	-0.00011	0.00024	0.00035	-0.00060
100	127.5	1.9924	0.1953	-0.00015	0.00039	0.00056	-0.00095
120	147.5	1.9931	0.2181	-0.00004	0.00045	0.00065	-0.00110
140	167.5	1.9935	0.2322	0.00016	0.00046	0.00066	-0.00111
160	187.5	1.9938	0.2401	0.00039	0.00043	0.00062	-0.00105
180	207.5	1.9940	0.2437	0.00063	0.00039	0.00057	-0.00097
200	227.5	1.9941	0.2441	0.00086	0.00036	0.00052	-0.00088
250	277.5	1.9943	0.2356	0.00129	0.00030	0.00044	-0.00074
300	327.5	1.9944	0.2193	0.00150	0.00032	0.00048	-0.00080
350	377.5	1.9945	0.1993	0.00150	0.00042	0.00062	-0.00104
400	427.5	1.9945	0.1776	0.00135	0.00058	0.00083	-0.00141
450	477.5	1.9946	0.1557	0.00109	0.00076	0.00110	-0.00186
500	527.5	1.9947	0.1342	0.00077	0.00097	0.00139	-0.00236
600	627.5	1.9948	0.0940	0.00004	0.00138	0.00197	-0.00335
700	727.5	1.9951	0.0584	-0.00068	0.00175	0.00248	-0.00422
800	827.5	1.9953	0.0279	-0.00132	0.00204	0.00289	-0.00494
900	927.5	1.9955	0.0021	-0.00187	0.00226	0.00321	-0.00547
1000	1027.5	1.9958	-0.0193	-0.00233	0.00242	0.00343	-0.00585
1100	1127.5	1.9960	-0.0367	-0.00269	0.00252	0.00357	-0.00608
1200	1227.5	1.9962	-0.0503	-0.00296	0.00256	0.00363	-0.00620
1300	1327.5	1.9965	-0.0607	-0.00316	0.00257	0.00364	-0.00621
1400	1427.5	1.9967	-0.0682	-0.00330	0.00254	0.00360	-0.00614
1500	1527.5	1.9969	-0.0729	-0.00338	0.00249	0.00352	-0.00601
1600	1627.5	1.9971	-0.0752	-0.00341	0.00241	0.00341	-0.00582
1700	1727.5	1.9973	-0.0754	-0.00340	0.00231	0.00327	-0.00558
1800	1827.5	1.9975	-0.0737	-0.00335	0.00220	0.00312	-0.00532
1900	1927.5	1.9976	-0.0701	-0.00327	0.00208	0.00295	-0.00503
2000	2027.5	1.9978	-0.0650	-0.00316	0.00195	0.00277	-0.00473
2500	2527.5	1.9982	-0.0211	-0.00235	0.00131	0.00186	-0.00317
3000	3027.5	1.9981	0.0435	-0.00131	0.00077	0.00109	-0.00186
3500	3527.5	1.9977	0.1197	-0.00026	0.00043	0.00061	-0.00104
4000	4027.5	1.9969	0.2019	0.00069	0.00033	0.00045	-0.00078
4500	4527.5	1.9959	0.2867	0.00149	0.00046	0.00062	-0.00108
5000	5027.5	1.9946	0.3720	0.00213	0.00081	0.00109	-0.00191

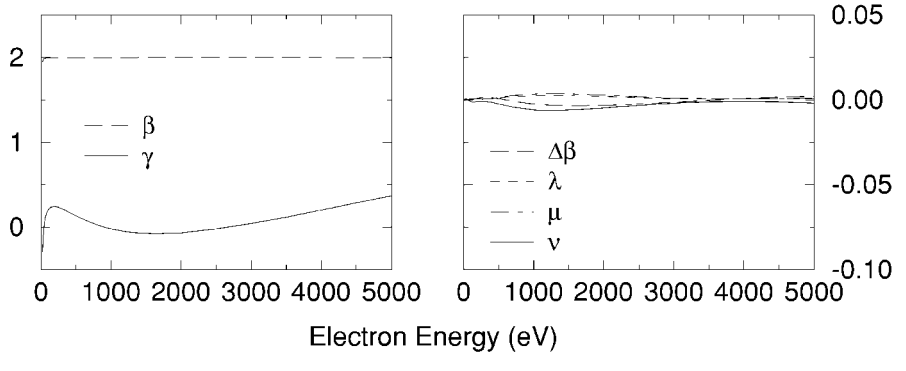

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4p_{1/2}$ shell of Kr $\quad E_b = 14.7$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	34.7	1.8702	-0.0020	0.1018	0.00005	0.00004	0.00013	-0.00017
40	54.7	1.1080	-0.0127	0.2372	0.00010	0.00056	0.00056	-0.00112
60	74.7	-0.0173	0.0060	0.0405	0.00008	0.00079	0.00036	-0.00115
80	94.7	-0.0151	0.0223	-0.0296	0.00029	0.00027	-0.00004	-0.00023
100	114.7	0.3542	0.0230	0.0331	0.00050	-0.00014	-0.00008	0.00022
120	134.7	0.6680	0.0190	0.0992	0.00059	-0.00031	0.00006	0.00025
140	154.7	0.8940	0.0146	0.1424	0.00059	-0.00034	0.00027	0.00007
160	174.7	1.0565	0.0109	0.1648	0.00052	-0.00030	0.00049	-0.00019
180	194.7	1.1762	0.0079	0.1725	0.00042	-0.00021	0.00069	-0.00048
200	214.7	1.2667	0.0055	0.1702	0.00030	-0.00011	0.00087	-0.00076
250	264.7	1.4160	0.0018	0.1421	-0.00003	0.00014	0.00121	-0.00136
300	314.7	1.5037	0.0000	0.1034	-0.00034	0.00034	0.00142	-0.00176
350	364.7	1.5589	-0.0009	0.0665	-0.00059	0.00048	0.00151	-0.00199
400	414.7	1.5951	-0.0012	0.0358	-0.00078	0.00055	0.00154	-0.00209
450	464.7	1.6194	-0.0012	0.0122	-0.00092	0.00058	0.00151	-0.00209
500	514.7	1.6358	-0.0011	-0.0045	-0.00101	0.00057	0.00145	-0.00201
600	614.7	1.6538	-0.0006	-0.0209	-0.00106	0.00047	0.00127	-0.00174
700	714.7	1.6600	0.0001	-0.0204	-0.00100	0.00032	0.00108	-0.00140
800	814.7	1.6596	0.0009	-0.0087	-0.00087	0.00016	0.00090	-0.00106
900	914.7	1.6553	0.0016	0.0105	-0.00070	-0.00001	0.00077	-0.00076
1000	1014.7	1.6484	0.0024	0.0346	-0.00052	-0.00015	0.00067	-0.00052
1100	1114.7	1.6400	0.0033	0.0618	-0.00034	-0.00028	0.00063	-0.00035
1200	1214.7	1.6306	0.0042	0.0911	-0.00017	-0.00038	0.00064	-0.00026
1300	1314.7	1.6204	0.0051	0.1216	-0.00001	-0.00046	0.00070	-0.00025
1400	1414.7	1.6098	0.0061	0.1527	0.00013	-0.00051	0.00082	-0.00031
1500	1514.7	1.5989	0.0071	0.1842	0.00025	-0.00053	0.00098	-0.00045
1600	1614.7	1.5878	0.0082	0.2157	0.00034	-0.00053	0.00120	-0.00067
1700	1714.7	1.5766	0.0093	0.2470	0.00042	-0.00050	0.00145	-0.00095
1800	1814.7	1.5653	0.0104	0.2780	0.00047	-0.00046	0.00176	-0.00130
1900	1914.7	1.5541	0.0116	0.3086	0.00049	-0.00039	0.00210	-0.00171
2000	2014.7	1.5429	0.0128	0.3386	0.00050	-0.00030	0.00248	-0.00218
2500	2514.7	1.4878	0.0193	0.4798	0.00022	0.00040	0.00486	-0.00527
3000	3014.7	1.4354	0.0265	0.6049	-0.00051	0.00140	0.00790	-0.00930
3500	3514.7	1.3861	0.0342	0.7151	-0.00155	0.00256	0.01136	-0.01392
4000	4014.7	1.3398	0.0422	0.8119	-0.00288	0.00383	0.01514	-0.01898
4500	4514.7	1.2964	0.0505	0.8975	-0.00436	0.00509	0.01911	-0.02421
5000	5014.7	1.2558	0.0589	0.9733	-0.00601	0.00633	0.02323	-0.02956

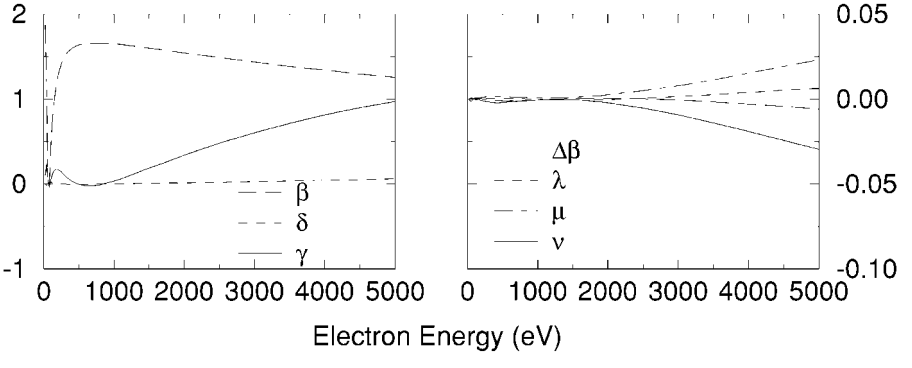

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4p_{3/2}$ shell of Kr $\quad E_b = 14.0$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	34.0	1.8943	-0.0025	0.1071	0.00005	0.00005	0.00013	-0.00018
40	54.0	0.9471	-0.0148	0.2303	0.00011	0.00058	0.00056	-0.00114
60	74.0	-0.1276	0.0075	0.0151	0.00011	0.00070	0.00025	-0.00096
80	94.0	0.0178	0.0228	-0.0281	0.00031	0.00023	-0.00012	-0.00011
100	114.0	0.3950	0.0231	0.0364	0.00048	-0.00009	-0.00015	0.00023
120	134.0	0.6912	0.0191	0.0972	0.00053	-0.00021	-0.00002	0.00023
140	154.0	0.9030	0.0148	0.1358	0.00051	-0.00021	0.00016	0.00005
160	174.0	1.0563	0.0111	0.1555	0.00044	-0.00015	0.00035	-0.00020
180	194.0	1.1705	0.0081	0.1618	0.00033	-0.00005	0.00052	-0.00047
200	214.0	1.2580	0.0058	0.1590	0.00021	0.00006	0.00068	-0.00073
250	264.0	1.4050	0.0020	0.1314	-0.00012	0.00034	0.00096	-0.00129
300	314.0	1.4938	0.0001	0.0942	-0.00041	0.00056	0.00111	-0.00167
350	364.0	1.5511	-0.0007	0.0589	-0.00065	0.00073	0.00116	-0.00189
400	414.0	1.5899	-0.0009	0.0296	-0.00083	0.00084	0.00114	-0.00198
450	464.0	1.6167	-0.0009	0.0074	-0.00095	0.00091	0.00107	-0.00198
500	514.0	1.6355	-0.0006	-0.0082	-0.00102	0.00094	0.00097	-0.00191
600	614.0	1.6578	0.0002	-0.0228	-0.00105	0.00094	0.00072	-0.00165
700	714.0	1.6676	0.0010	-0.0209	-0.00098	0.00088	0.00045	-0.00133
800	814.0	1.6703	0.0019	-0.0079	-0.00084	0.00081	0.00021	-0.00101
900	914.0	1.6684	0.0028	0.0124	-0.00067	0.00074	0.00000	-0.00073
1000	1014.0	1.6638	0.0037	0.0375	-0.00048	0.00068	-0.00017	-0.00052
1100	1114.0	1.6572	0.0046	0.0657	-0.00030	0.00065	-0.00028	-0.00037
1200	1214.0	1.6492	0.0055	0.0959	-0.00013	0.00065	-0.00034	-0.00031
1300	1314.0	1.6404	0.0065	0.1273	0.00002	0.00067	-0.00035	-0.00032
1400	1414.0	1.6309	0.0075	0.1594	0.00015	0.00073	-0.00031	-0.00042
1500	1514.0	1.6209	0.0085	0.1917	0.00026	0.00081	-0.00022	-0.00059
1600	1614.0	1.6107	0.0095	0.2241	0.00035	0.00092	-0.00008	-0.00083
1700	1714.0	1.6001	0.0105	0.2562	0.00041	0.00105	0.00010	-0.00115
1800	1814.0	1.5895	0.0116	0.2880	0.00045	0.00121	0.00033	-0.00154
1900	1914.0	1.5787	0.0128	0.3193	0.00047	0.00139	0.00059	-0.00198
2000	2014.0	1.5679	0.0139	0.3502	0.00046	0.00159	0.00089	-0.00249
2500	2514.0	1.5141	0.0202	0.4949	0.00011	0.00288	0.00288	-0.00576
3000	3014.0	1.4618	0.0272	0.6231	-0.00069	0.00451	0.00550	-0.01001
3500	3514.0	1.4118	0.0346	0.7357	-0.00181	0.00631	0.00852	-0.01484
4000	4014.0	1.3645	0.0425	0.8346	-0.00321	0.00826	0.01186	-0.02012
4500	4514.0	1.3198	0.0507	0.9218	-0.00477	0.01019	0.01536	-0.02555
5000	5014.0	1.2776	0.0590	0.9988	-0.00649	0.01211	0.01898	-0.03109

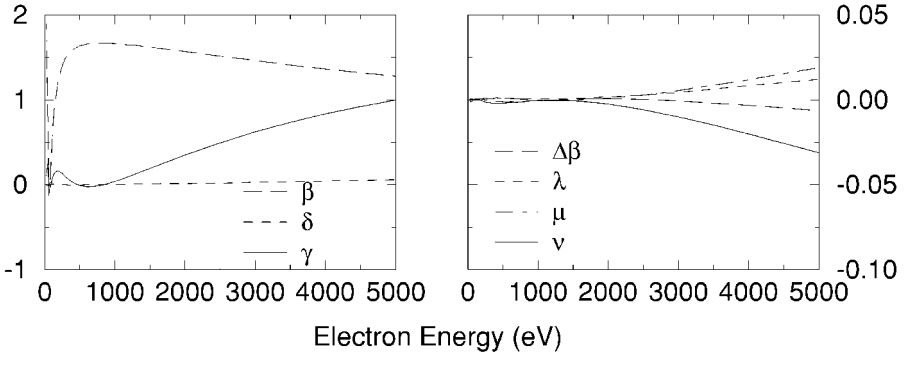

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

1s shell of Xe $E_b = 34565.2$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	34585.2	1.9646	-1.4424	0.01492	0.00614	0.00708	-0.01322
40	34605.2	1.9648	-1.4746	0.00500	0.01157	0.01477	-0.02634
60	34625.2	1.9648	-1.4352	0.00270	0.01285	0.01656	-0.02942
80	34645.2	1.9648	-1.3867	0.00230	0.01309	0.01689	-0.02998
100	34665.2	1.9648	-1.3388	0.00262	0.01294	0.01666	-0.02960
120	34685.2	1.9648	-1.2935	0.00323	0.01263	0.01622	-0.02885
140	34705.2	1.9647	-1.2511	0.00395	0.01226	0.01570	-0.02796
160	34725.2	1.9646	-1.2115	0.00470	0.01188	0.01516	-0.02704
180	34745.2	1.9646	-1.1744	0.00546	0.01150	0.01462	-0.02612
200	34765.2	1.9645	-1.1395	0.00621	0.01113	0.01410	-0.02523
250	34815.2	1.9643	-1.0606	0.00798	0.01028	0.01289	-0.02317
300	34865.2	1.9640	-0.9910	0.00960	0.00952	0.01182	-0.02134
350	34915.2	1.9638	-0.9286	0.01109	0.00885	0.01086	-0.01970
400	34965.2	1.9635	-0.8719	0.01246	0.00824	0.01000	-0.01824
450	35015.2	1.9633	-0.8198	0.01372	0.00770	0.00923	-0.01693
500	35065.2	1.9630	-0.7714	0.01489	0.00721	0.00853	-0.01574
600	35165.2	1.9624	-0.6839	0.01699	0.00637	0.00733	-0.01370
700	35265.2	1.9618	-0.6058	0.01882	0.00569	0.00634	-0.01203
800	35365.2	1.9613	-0.5351	0.02043	0.00513	0.00554	-0.01066
900	35465.2	1.9607	-0.4702	0.02185	0.00467	0.00487	-0.00954
1000	35565.2	1.9601	-0.4101	0.02312	0.00430	0.00433	-0.00863
1100	35665.2	1.9595	-0.3539	0.02426	0.00401	0.00390	-0.00791
1200	35765.2	1.9589	-0.3011	0.02527	0.00378	0.00356	-0.00734
1300	35865.2	1.9583	-0.2512	0.02619	0.00361	0.00330	-0.00691
1400	35965.2	1.9577	-0.2039	0.02702	0.00349	0.00311	-0.00660
1500	36065.2	1.9571	-0.1587	0.02777	0.00341	0.00298	-0.00639
1600	36165.2	1.9565	-0.1156	0.02845	0.00337	0.00291	-0.00628
1700	36265.2	1.9559	-0.0742	0.02907	0.00337	0.00288	-0.00625
1800	36365.2	1.9553	-0.0344	0.02963	0.00340	0.00290	-0.00629
1900	36465.2	1.9547	0.0039	0.03014	0.00345	0.00295	-0.00641
2000	36565.2	1.9541	0.0409	0.03061	0.00353	0.00305	-0.00658
2500	37065.2	1.9510	0.2096	0.03239	0.00424	0.00393	-0.00817
3000	37565.2	1.9480	0.3573	0.03350	0.00532	0.00535	-0.01067
3500	38065.2	1.9449	0.4896	0.03415	0.00666	0.00712	-0.01378
4000	38565.2	1.9418	0.6101	0.03445	0.00818	0.00915	-0.01733
4500	39065.2	1.9388	0.7211	0.03450	0.00984	0.01137	-0.02121
5000	39565.2	1.9357	0.8244	0.03435	0.01161	0.01374	-0.02535

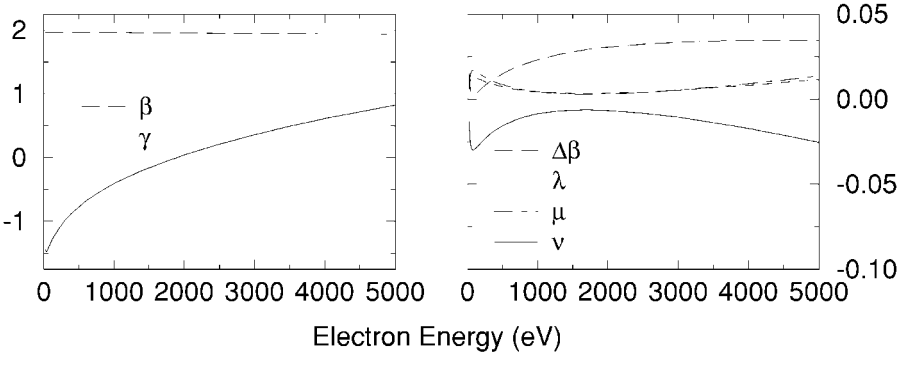

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2s$ shell of Xe $E_b = 5452.6$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	5472.6	1.9620	1.4408	-0.00698	0.01744	0.02491	-0.04235
40	5492.6	1.9624	1.4629	0.01871	0.00293	0.00459	-0.00752
60	5512.6	1.9628	1.4134	0.02450	-0.00049	-0.00020	0.00069
80	5532.6	1.9631	1.3557	0.02536	-0.00117	-0.00114	0.00231
100	5552.6	1.9635	1.2991	0.02438	-0.00081	-0.00063	0.00144
120	5572.6	1.9638	1.2457	0.02267	-0.00004	0.00044	-0.00040
140	5592.6	1.9641	1.1959	0.02071	0.00088	0.00173	-0.00261
160	5612.6	1.9645	1.1493	0.01868	0.00184	0.00308	-0.00491
180	5632.6	1.9648	1.1057	0.01669	0.00279	0.00441	-0.00720
200	5652.6	1.9651	1.0648	0.01475	0.00371	0.00570	-0.00942
250	5702.6	1.9658	0.9725	0.01025	0.00585	0.00869	-0.01454
300	5752.6	1.9665	0.8916	0.00625	0.00773	0.01133	-0.01906
350	5802.6	1.9672	0.8198	0.00269	0.00938	0.01364	-0.02302
400	5852.6	1.9678	0.7552	-0.00049	0.01083	0.01567	-0.02650
450	5902.6	1.9684	0.6967	-0.00334	0.01211	0.01746	-0.02957
500	5952.6	1.9690	0.6432	-0.00590	0.01324	0.01903	-0.03227
600	6052.6	1.9702	0.5489	-0.01029	0.01510	0.02164	-0.03675
700	6152.6	1.9713	0.4680	-0.01387	0.01655	0.02366	-0.04022
800	6252.6	1.9724	0.3979	-0.01679	0.01766	0.02521	-0.04288
900	6352.6	1.9734	0.3365	-0.01918	0.01850	0.02638	-0.04488
1000	6452.6	1.9743	0.2825	-0.02113	0.01912	0.02724	-0.04635
1100	6552.6	1.9752	0.2347	-0.02272	0.01955	0.02783	-0.04738
1200	6652.6	1.9761	0.1922	-0.02399	0.01983	0.02822	-0.04805
1300	6752.6	1.9769	0.1545	-0.02500	0.01999	0.02843	-0.04842
1400	6852.6	1.9777	0.1209	-0.02579	0.02004	0.02849	-0.04853
1500	6952.6	1.9785	0.0909	-0.02639	0.02000	0.02843	-0.04843
1600	7052.6	1.9792	0.0643	-0.02683	0.01989	0.02827	-0.04816
1700	7152.6	1.9799	0.0405	-0.02713	0.01972	0.02803	-0.04775
1800	7252.6	1.9806	0.0194	-0.02731	0.01950	0.02771	-0.04721
1900	7352.6	1.9812	0.0007	-0.02739	0.01924	0.02733	-0.04657
2000	7452.6	1.9818	-0.0159	-0.02737	0.01894	0.02691	-0.04585
2500	7952.6	1.9843	-0.0719	-0.02634	0.01712	0.02431	-0.04143
3000	8452.6	1.9863	-0.0948	-0.02434	0.01506	0.02138	-0.03645
3500	8952.6	1.9877	-0.0950	-0.02189	0.01301	0.01846	-0.03147
4000	9452.6	1.9887	-0.0791	-0.01928	0.01109	0.01572	-0.02681
4500	9952.6	1.9894	-0.0517	-0.01664	0.00934	0.01323	-0.02257
5000	10452.6	1.9897	-0.0158	-0.01408	0.00781	0.01103	-0.01883

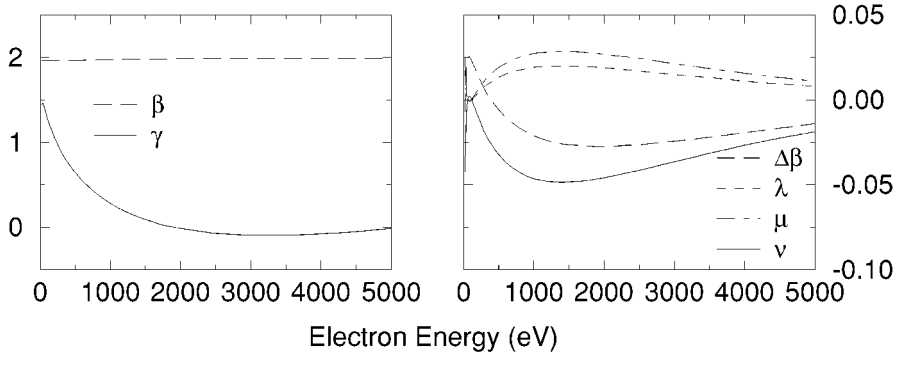

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{1/2}$ shell of Xe $\quad E_b = 5106.7$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	5126.7	0.6150	0.0790	-0.0543	0.00160	-0.00611	0.00267	0.00345
40	5146.7	0.7225	-0.0022	-0.2586	0.00157	-0.00349	0.00298	0.00052
60	5166.7	0.8024	-0.0192	-0.3300	0.00161	-0.00284	0.00308	-0.00024
80	5186.7	0.8631	-0.0244	-0.3692	0.00160	-0.00267	0.00309	-0.00042
100	5206.7	0.9115	-0.0253	-0.3917	0.00160	-0.00267	0.00304	-0.00037
120	5226.7	0.9516	-0.0244	-0.4045	0.00163	-0.00275	0.00297	-0.00023
140	5246.7	0.9856	-0.0229	-0.4114	0.00168	-0.00285	0.00289	-0.00004
160	5266.7	1.0152	-0.0212	-0.4144	0.00176	-0.00297	0.00279	0.00018
180	5286.7	1.0411	-0.0194	-0.4149	0.00186	-0.00309	0.00268	0.00041
200	5306.7	1.0641	-0.0177	-0.4135	0.00199	-0.00321	0.00256	0.00065
250	5356.7	1.1123	-0.0136	-0.4048	0.00240	-0.00352	0.00225	0.00127
300	5406.7	1.1507	-0.0099	-0.3914	0.00288	-0.00382	0.00192	0.00190
350	5456.7	1.1822	-0.0067	-0.3753	0.00338	-0.00411	0.00161	0.00250
400	5506.7	1.2087	-0.0038	-0.3573	0.00388	-0.00440	0.00133	0.00307
450	5556.7	1.2313	-0.0011	-0.3381	0.00436	-0.00467	0.00107	0.00360
500	5606.7	1.2508	0.0013	-0.3181	0.00481	-0.00493	0.00085	0.00408
600	5706.7	1.2830	0.0056	-0.2766	0.00565	-0.00541	0.00051	0.00491
700	5806.7	1.3083	0.0094	-0.2342	0.00638	-0.00584	0.00028	0.00556
800	5906.7	1.3286	0.0127	-0.1916	0.00702	-0.00620	0.00015	0.00606
900	6006.7	1.3453	0.0156	-0.1493	0.00758	-0.00652	0.00010	0.00641
1000	6106.7	1.3590	0.0183	-0.1077	0.00807	-0.00678	0.00013	0.00665
1100	6206.7	1.3705	0.0208	-0.0669	0.00851	-0.00700	0.00022	0.00678
1200	6306.7	1.3800	0.0230	-0.0269	0.00890	-0.00718	0.00037	0.00681
1300	6406.7	1.3880	0.0251	0.0120	0.00923	-0.00732	0.00057	0.00676
1400	6506.7	1.3948	0.0270	0.0500	0.00953	-0.00744	0.00081	0.00663
1500	6606.7	1.4004	0.0288	0.0870	0.00978	-0.00752	0.00109	0.00642
1600	6706.7	1.4051	0.0305	0.1230	0.01000	-0.00757	0.00142	0.00615
1700	6806.7	1.4090	0.0321	0.1581	0.01018	-0.00759	0.00177	0.00582
1800	6906.7	1.4122	0.0337	0.1922	0.01033	-0.00760	0.00216	0.00544
1900	7006.7	1.4147	0.0352	0.2254	0.01045	-0.00758	0.00258	0.00500
2000	7106.7	1.4168	0.0366	0.2578	0.01054	-0.00754	0.00302	0.00452
2500	7606.7	1.4208	0.0430	0.4077	0.01065	-0.00710	0.00559	0.00151
3000	8106.7	1.4178	0.0486	0.5405	0.01027	-0.00634	0.00862	-0.00227
3500	8606.7	1.4105	0.0539	0.6595	0.00954	-0.00537	0.01197	-0.00660
4000	9106.7	1.4006	0.0589	0.7671	0.00853	-0.00424	0.01556	-0.01132
4500	9606.7	1.3888	0.0637	0.8650	0.00732	-0.00300	0.01934	-0.01634
5000	10106.7	1.3759	0.0685	0.9547	0.00594	-0.00169	0.02326	-0.02157

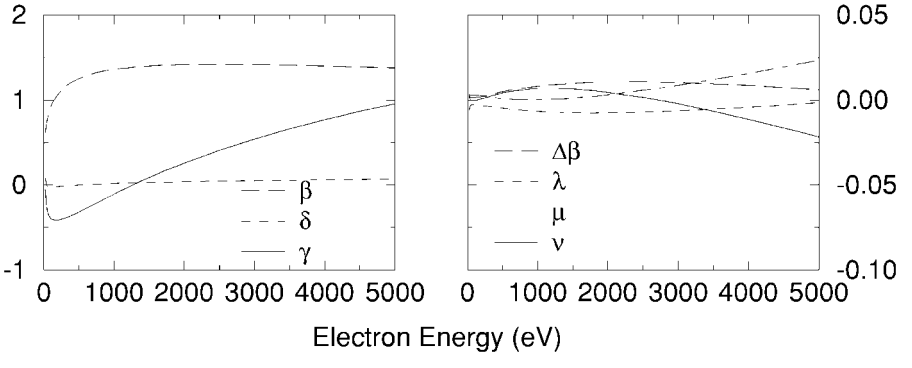

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$2p_{3/2}$ shell of Xe $\quad E_b = 4786.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	4806.5	0.5501	0.0788	-0.0429	0.00159	0.00230	-0.00523	0.00294
40	4826.5	0.6688	-0.0065	-0.2472	0.00153	0.00456	-0.00459	0.00004
60	4846.5	0.7583	-0.0231	-0.3240	0.00156	0.00499	-0.00420	-0.00079
80	4866.5	0.8268	-0.0273	-0.3684	0.00157	0.00501	-0.00397	-0.00104
100	4886.5	0.8818	-0.0272	-0.3953	0.00157	0.00488	-0.00383	-0.00105
120	4906.5	0.9274	-0.0255	-0.4117	0.00160	0.00471	-0.00376	-0.00094
140	4926.5	0.9663	-0.0232	-0.4216	0.00166	0.00452	-0.00373	-0.00079
160	4946.5	1.0001	-0.0207	-0.4272	0.00175	0.00433	-0.00373	-0.00060
180	4966.5	1.0298	-0.0183	-0.4298	0.00187	0.00415	-0.00376	-0.00039
200	4986.5	1.0563	-0.0160	-0.4303	0.00201	0.00397	-0.00381	-0.00016
250	5036.5	1.1119	-0.0108	-0.4250	0.00245	0.00356	-0.00399	0.00043
300	5086.5	1.1563	-0.0063	-0.4140	0.00296	0.00317	-0.00422	0.00105
350	5136.5	1.1929	-0.0023	-0.3994	0.00349	0.00280	-0.00446	0.00166
400	5186.5	1.2237	0.0011	-0.3824	0.00401	0.00246	-0.00469	0.00224
450	5236.5	1.2502	0.0042	-0.3638	0.00452	0.00213	-0.00491	0.00278
500	5286.5	1.2731	0.0070	-0.3441	0.00499	0.00183	-0.00510	0.00327
600	5386.5	1.3110	0.0118	-0.3023	0.00586	0.00128	-0.00541	0.00413
700	5486.5	1.3411	0.0159	-0.2590	0.00661	0.00081	-0.00562	0.00481
800	5586.5	1.3655	0.0194	-0.2150	0.00727	0.00042	-0.00575	0.00533
900	5686.5	1.3855	0.0225	-0.1711	0.00785	0.00009	-0.00579	0.00571
1000	5786.5	1.4023	0.0252	-0.1275	0.00835	-0.00018	-0.00578	0.00595
1100	5886.5	1.4163	0.0276	-0.0846	0.00879	-0.00039	-0.00570	0.00609
1200	5986.5	1.4282	0.0298	-0.0425	0.00918	-0.00055	-0.00557	0.00612
1300	6086.5	1.4383	0.0318	-0.0013	0.00951	-0.00066	-0.00540	0.00606
1400	6186.5	1.4468	0.0336	0.0390	0.00980	-0.00073	-0.00518	0.00591
1500	6286.5	1.4541	0.0353	0.0783	0.01004	-0.00077	-0.00492	0.00569
1600	6386.5	1.4603	0.0369	0.1166	0.01025	-0.00077	-0.00463	0.00539
1700	6486.5	1.4655	0.0383	0.1540	0.01042	-0.00074	-0.00430	0.00504
1800	6586.5	1.4699	0.0397	0.1904	0.01056	-0.00068	-0.00394	0.00462
1900	6686.5	1.4736	0.0410	0.2260	0.01066	-0.00059	-0.00355	0.00414
2000	6786.5	1.4766	0.0422	0.2606	0.01074	-0.00048	-0.00313	0.00361
2500	7286.5	1.4845	0.0477	0.4214	0.01074	0.00039	-0.00072	0.00033
3000	7786.5	1.4840	0.0524	0.5643	0.01024	0.00165	0.00215	-0.00380
3500	8286.5	1.4783	0.0567	0.6925	0.00936	0.00320	0.00534	-0.00854
4000	8786.5	1.4691	0.0609	0.8083	0.00821	0.00494	0.00878	-0.01372
4500	9286.5	1.4576	0.0650	0.9138	0.00684	0.00682	0.01240	-0.01922
5000	9786.5	1.4446	0.0691	1.0104	0.00529	0.00880	0.01616	-0.02496

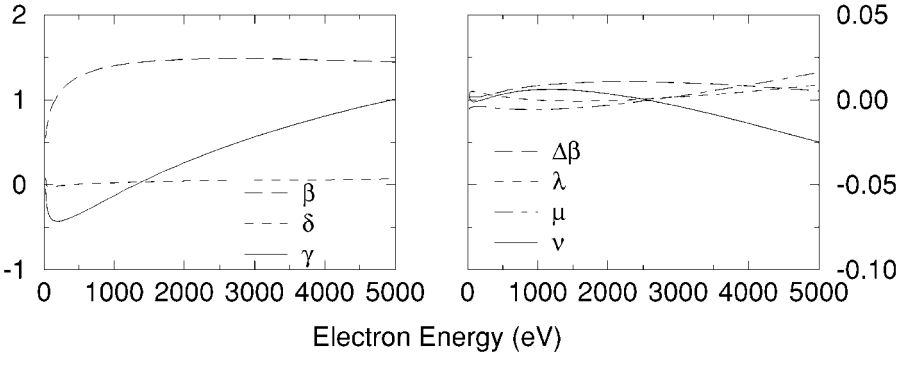

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3s$ shell of Xe $E_b = 1150.5$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	1170.5	1.9658	0.9139	0.01468	-0.00271	-0.00358	0.00629
40	1190.5	1.9660	0.9385	-0.00313	0.00719	0.01030	-0.01748
60	1210.5	1.9663	0.9166	-0.00663	0.00917	0.01306	-0.02223
80	1230.5	1.9667	0.8882	-0.00678	0.00928	0.01323	-0.02251
100	1250.5	1.9670	0.8595	-0.00580	0.00877	0.01251	-0.02128
120	1270.5	1.9673	0.8320	-0.00448	0.00807	0.01152	-0.01959
140	1290.5	1.9676	0.8059	-0.00312	0.00733	0.01049	-0.01782
160	1310.5	1.9679	0.7812	-0.00182	0.00664	0.00951	-0.01615
180	1330.5	1.9681	0.7579	-0.00063	0.00600	0.00862	-0.01462
200	1350.5	1.9684	0.7357	0.00044	0.00542	0.00782	-0.01324
250	1400.5	1.9690	0.6846	0.00260	0.00426	0.00619	-0.01046
300	1450.5	1.9696	0.6386	0.00414	0.00344	0.00504	-0.00848
350	1500.5	1.9702	0.5966	0.00518	0.00288	0.00425	-0.00713
400	1550.5	1.9707	0.5578	0.00583	0.00252	0.00375	-0.00627
450	1600.5	1.9712	0.5217	0.00618	0.00232	0.00347	-0.00579
500	1650.5	1.9716	0.4880	0.00629	0.00224	0.00337	-0.00561
600	1750.5	1.9725	0.4264	0.00599	0.00234	0.00351	-0.00586
700	1850.5	1.9733	0.3714	0.00524	0.00267	0.00398	-0.00665
800	1950.5	1.9741	0.3219	0.00423	0.00312	0.00461	-0.00773
900	2050.5	1.9748	0.2771	0.00307	0.00363	0.00533	-0.00896
1000	2150.5	1.9755	0.2365	0.00185	0.00416	0.00607	-0.01024
1100	2250.5	1.9762	0.1996	0.00063	0.00468	0.00681	-0.01149
1200	2350.5	1.9768	0.1659	-0.00056	0.00518	0.00750	-0.01268
1300	2450.5	1.9774	0.1352	-0.00170	0.00564	0.00815	-0.01379
1400	2550.5	1.9780	0.1072	-0.00277	0.00606	0.00874	-0.01480
1500	2650.5	1.9785	0.0817	-0.00377	0.00644	0.00927	-0.01571
1600	2750.5	1.9791	0.0585	-0.00469	0.00677	0.00974	-0.01651
1700	2850.5	1.9796	0.0373	-0.00554	0.00706	0.01015	-0.01721
1800	2950.5	1.9801	0.0180	-0.00631	0.00731	0.01050	-0.01781
1900	3050.5	1.9806	0.0006	-0.00701	0.00752	0.01079	-0.01832
2000	3150.5	1.9811	-0.0153	-0.00764	0.00770	0.01103	-0.01873
2500	3650.5	1.9832	-0.0735	-0.00985	0.00810	0.01159	-0.01968
3000	4150.5	1.9850	-0.1043	-0.01086	0.00793	0.01134	-0.01927
3500	4650.5	1.9864	-0.1150	-0.01105	0.00742	0.01061	-0.01803
4000	5150.5	1.9876	-0.1106	-0.01068	0.00672	0.00961	-0.01633
4500	5650.5	1.9885	-0.0946	-0.00995	0.00594	0.00850	-0.01444
5000	6150.5	1.9891	-0.0697	-0.00899	0.00515	0.00736	-0.01251

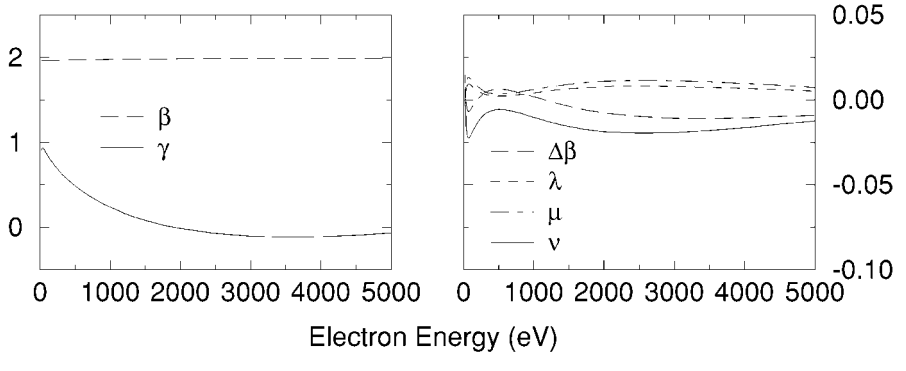

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{1/2}$ shell of Xe $\quad E_b = 1003.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	1023.5	0.0838	-0.0559	-0.4824	0.00870	-0.00052	0.01107	-0.01055
40	1043.5	0.3286	0.1608	-0.2459	0.00492	-0.00483	0.00504	-0.00021
60	1063.5	0.5089	0.1805	-0.0475	0.00446	-0.00554	0.00360	0.00194
80	1083.5	0.6444	0.1707	0.0967	0.00444	-0.00550	0.00296	0.00254
100	1103.5	0.7511	0.1540	0.1951	0.00443	-0.00526	0.00264	0.00262
120	1123.5	0.8382	0.1370	0.2606	0.00434	-0.00498	0.00250	0.00247
140	1143.5	0.9110	0.1214	0.3032	0.00414	-0.00470	0.00251	0.00219
160	1163.5	0.9732	0.1077	0.3299	0.00384	-0.00443	0.00261	0.00182
180	1183.5	1.0270	0.0958	0.3452	0.00345	-0.00417	0.00278	0.00138
200	1203.5	1.0740	0.0854	0.3524	0.00300	-0.00391	0.00302	0.00089
250	1253.5	1.1696	0.0649	0.3478	0.00169	-0.00325	0.00373	-0.00048
300	1303.5	1.2428	0.0502	0.3250	0.00031	-0.00258	0.00450	-0.00192
350	1353.5	1.3004	0.0393	0.2942	-0.00098	-0.00193	0.00521	-0.00327
400	1403.5	1.3470	0.0312	0.2603	-0.00213	-0.00133	0.00581	-0.00448
450	1453.5	1.3852	0.0249	0.2263	-0.00311	-0.00079	0.00629	-0.00550
500	1503.5	1.4170	0.0200	0.1935	-0.00392	-0.00032	0.00665	-0.00632
600	1603.5	1.4665	0.0132	0.1347	-0.00512	0.00040	0.00706	-0.00746
700	1703.5	1.5026	0.0088	0.0865	-0.00587	0.00086	0.00717	-0.00803
800	1803.5	1.5295	0.0060	0.0489	-0.00630	0.00113	0.00708	-0.00820
900	1903.5	1.5499	0.0041	0.0207	-0.00648	0.00124	0.00685	-0.00809
1000	2003.5	1.5654	0.0029	0.0008	-0.00650	0.00125	0.00654	-0.00778
1100	2103.5	1.5772	0.0022	-0.0121	-0.00640	0.00117	0.00618	-0.00735
1200	2203.5	1.5861	0.0017	-0.0191	-0.00620	0.00104	0.00580	-0.00685
1300	2303.5	1.5928	0.0015	-0.0212	-0.00594	0.00088	0.00542	-0.00630
1400	2403.5	1.5976	0.0014	-0.0192	-0.00563	0.00069	0.00504	-0.00573
1500	2503.5	1.6010	0.0015	-0.0138	-0.00529	0.00048	0.00468	-0.00517
1600	2603.5	1.6032	0.0017	-0.0055	-0.00493	0.00027	0.00434	-0.00462
1700	2703.5	1.6044	0.0019	0.0052	-0.00455	0.00006	0.00403	-0.00409
1800	2803.5	1.6047	0.0022	0.0177	-0.00417	-0.00014	0.00374	-0.00360
1900	2903.5	1.6044	0.0026	0.0319	-0.00379	-0.00034	0.00349	-0.00314
2000	3003.5	1.6035	0.0029	0.0475	-0.00341	-0.00054	0.00326	-0.00272
2500	3503.5	1.5926	0.0054	0.1380	-0.00165	-0.00130	0.00259	-0.00129
3000	4003.5	1.5758	0.0084	0.2386	-0.00022	-0.00173	0.00265	-0.00092
3500	4503.5	1.5560	0.0117	0.3410	0.00084	-0.00184	0.00334	-0.00150
4000	5003.5	1.5348	0.0154	0.4414	0.00155	-0.00167	0.00457	-0.00291
4500	5503.5	1.5130	0.0193	0.5381	0.00193	-0.00126	0.00625	-0.00499
5000	6003.5	1.4911	0.0234	0.6304	0.00204	-0.00066	0.00832	-0.00766

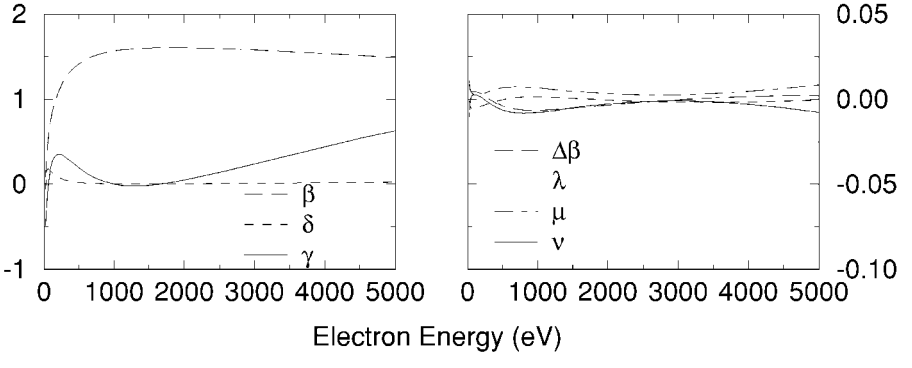

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3p_{3/2}$ shell of Xe $\quad E_b = 941.9$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	961.9	0.0466	-0.0491	-0.4212	0.00717	0.00133	0.00757	-0.00890
40	981.9	0.2888	0.1509	-0.2264	0.00411	-0.00238	0.00271	-0.00033
60	1001.9	0.4700	0.1682	-0.0519	0.00374	-0.00314	0.00152	0.00162
80	1021.9	0.6073	0.1583	0.0768	0.00374	-0.00324	0.00100	0.00224
100	1041.9	0.7161	0.1423	0.1651	0.00373	-0.00314	0.00074	0.00240
120	1061.9	0.8054	0.1261	0.2239	0.00363	-0.00299	0.00065	0.00234
140	1081.9	0.8804	0.1114	0.2621	0.00342	-0.00282	0.00067	0.00215
160	1101.9	0.9447	0.0984	0.2859	0.00313	-0.00265	0.00079	0.00186
180	1121.9	1.0005	0.0872	0.2994	0.00275	-0.00247	0.00097	0.00150
200	1141.9	1.0495	0.0774	0.3055	0.00231	-0.00228	0.00120	0.00108
250	1191.9	1.1499	0.0584	0.3000	0.00106	-0.00175	0.00188	-0.00013
300	1241.9	1.2273	0.0448	0.2782	-0.00023	-0.00117	0.00261	-0.00144
350	1291.9	1.2890	0.0348	0.2490	-0.00144	-0.00057	0.00327	-0.00270
400	1341.9	1.3392	0.0275	0.2172	-0.00250	0.00001	0.00383	-0.00383
450	1391.9	1.3808	0.0219	0.1853	-0.00340	0.00053	0.00426	-0.00479
500	1441.9	1.4158	0.0177	0.1548	-0.00413	0.00100	0.00458	-0.00558
600	1541.9	1.4709	0.0120	0.1004	-0.00520	0.00176	0.00492	-0.00667
700	1641.9	1.5121	0.0086	0.0563	-0.00583	0.00228	0.00497	-0.00724
800	1741.9	1.5435	0.0066	0.0224	-0.00616	0.00261	0.00482	-0.00743
900	1841.9	1.5679	0.0054	-0.0024	-0.00626	0.00281	0.00454	-0.00735
1000	1941.9	1.5870	0.0048	-0.0192	-0.00622	0.00290	0.00419	-0.00709
1100	2041.9	1.6021	0.0046	-0.0292	-0.00605	0.00291	0.00380	-0.00670
1200	2141.9	1.6140	0.0046	-0.0335	-0.00581	0.00287	0.00338	-0.00625
1300	2241.9	1.6234	0.0048	-0.0331	-0.00551	0.00279	0.00297	-0.00575
1400	2341.9	1.6308	0.0051	-0.0286	-0.00518	0.00269	0.00256	-0.00525
1500	2441.9	1.6365	0.0054	-0.0209	-0.00481	0.00258	0.00216	-0.00474
1600	2541.9	1.6408	0.0058	-0.0105	-0.00443	0.00246	0.00179	-0.00425
1700	2641.9	1.6439	0.0063	0.0022	-0.00405	0.00234	0.00145	-0.00378
1800	2741.9	1.6461	0.0068	0.0168	-0.00366	0.00222	0.00113	-0.00335
1900	2841.9	1.6474	0.0073	0.0330	-0.00327	0.00212	0.00084	-0.00296
2000	2941.9	1.6481	0.0078	0.0504	-0.00289	0.00202	0.00058	-0.00260
2500	3441.9	1.6436	0.0106	0.1497	-0.00117	0.00173	-0.00024	-0.00149
3000	3941.9	1.6312	0.0135	0.2582	0.00016	0.00181	-0.00033	-0.00148
3500	4441.9	1.6146	0.0167	0.3678	0.00109	0.00224	0.00020	-0.00244
4000	4941.9	1.5956	0.0200	0.4749	0.00164	0.00298	0.00127	-0.00424
4500	5441.9	1.5753	0.0234	0.5779	0.00187	0.00397	0.00278	-0.00675
5000	5941.9	1.5542	0.0271	0.6761	0.00180	0.00518	0.00467	-0.00985

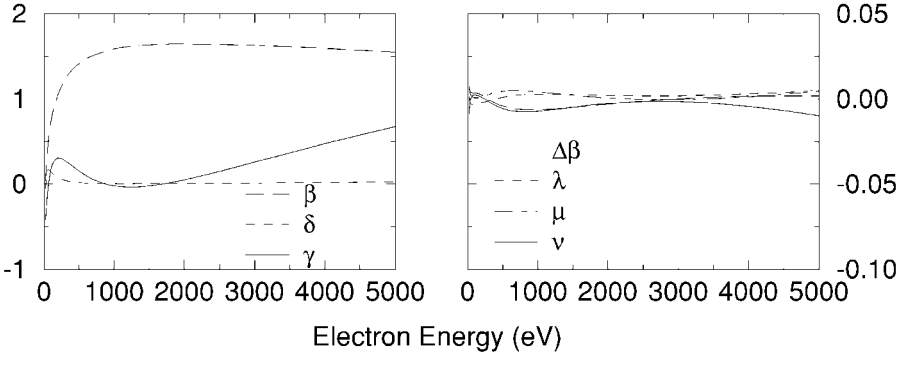

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3d_{3/2}$ shell of Xe $\quad E_b = 690.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	710.5	1.0145	-0.0017	0.0155	0.00020	-0.00013	-0.00036	0.00048
40	730.5	0.5992	-0.0016	-0.0055	0.00015	0.00000	-0.00033	0.00034
60	750.5	0.4336	-0.0016	-0.0226	0.00015	0.00006	-0.00033	0.00027
80	770.5	0.3899	-0.0018	-0.0363	0.00017	0.00010	-0.00033	0.00023
100	790.5	0.3986	-0.0019	-0.0478	0.00021	0.00012	-0.00033	0.00021
120	810.5	0.4303	-0.0018	-0.0578	0.00026	0.00014	-0.00034	0.00020
140	830.5	0.4717	-0.0013	-0.0666	0.00031	0.00016	-0.00035	0.00020
160	850.5	0.5164	-0.0005	-0.0742	0.00037	0.00016	-0.00037	0.00021
180	870.5	0.5612	0.0007	-0.0806	0.00044	0.00016	-0.00038	0.00022
200	890.5	0.6047	0.0021	-0.0858	0.00051	0.00015	-0.00040	0.00025
250	940.5	0.7034	0.0063	-0.0934	0.00070	0.00009	-0.00043	0.00035
300	990.5	0.7867	0.0111	-0.0936	0.00091	-0.00001	-0.00046	0.00047
350	1040.5	0.8564	0.0160	-0.0879	0.00111	-0.00012	-0.00047	0.00060
400	1090.5	0.9146	0.0205	-0.0776	0.00131	-0.00025	-0.00047	0.00072
450	1140.5	0.9634	0.0247	-0.0640	0.00149	-0.00038	-0.00045	0.00082
500	1190.5	1.0046	0.0285	-0.0482	0.00166	-0.00051	-0.00040	0.00091
600	1290.5	1.0692	0.0350	-0.0125	0.00195	-0.00076	-0.00024	0.00100
700	1390.5	1.1163	0.0403	0.0257	0.00217	-0.00098	0.00000	0.00097
800	1490.5	1.1508	0.0448	0.0648	0.00232	-0.00116	0.00033	0.00083
900	1590.5	1.1762	0.0488	0.1038	0.00240	-0.00132	0.00073	0.00059
1000	1690.5	1.1948	0.0523	0.1422	0.00244	-0.00144	0.00119	0.00025
1100	1790.5	1.2081	0.0556	0.1799	0.00243	-0.00153	0.00171	-0.00018
1200	1890.5	1.2173	0.0586	0.2168	0.00239	-0.00160	0.00228	-0.00068
1300	1990.5	1.2232	0.0616	0.2528	0.00232	-0.00165	0.00290	-0.00125
1400	2090.5	1.2266	0.0644	0.2879	0.00221	-0.00168	0.00356	-0.00188
1500	2190.5	1.2279	0.0672	0.3222	0.00208	-0.00168	0.00425	-0.00257
1600	2290.5	1.2276	0.0699	0.3555	0.00193	-0.00167	0.00498	-0.00331
1700	2390.5	1.2259	0.0726	0.3880	0.00175	-0.00165	0.00575	-0.00410
1800	2490.5	1.2231	0.0753	0.4196	0.00156	-0.00161	0.00654	-0.00493
1900	2590.5	1.2193	0.0779	0.4504	0.00134	-0.00156	0.00736	-0.00580
2000	2690.5	1.2148	0.0806	0.4804	0.00111	-0.00150	0.00821	-0.00671
2500	3190.5	1.1849	0.0940	0.6192	-0.00028	-0.00108	0.01279	-0.01171
3000	3690.5	1.1487	0.1075	0.7412	-0.00202	-0.00050	0.01784	-0.01734
3500	4190.5	1.1106	0.1211	0.8488	-0.00405	0.00017	0.02327	-0.02343
4000	4690.5	1.0725	0.1348	0.9441	-0.00633	0.00088	0.02899	-0.02986
4500	5190.5	1.0354	0.1486	1.0286	-0.00884	0.00160	0.03493	-0.03653
5000	5690.5	0.9997	0.1622	1.1036	-0.01154	0.00231	0.04105	-0.04336

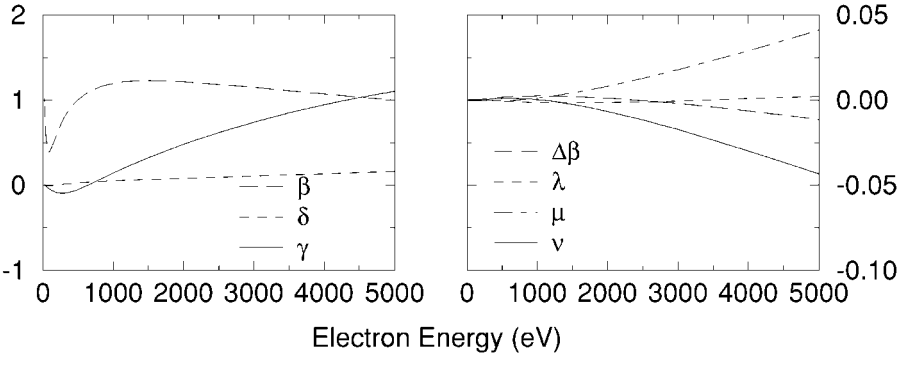

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$3d_{5/2}$ shell of Xe $\quad E_b = 677.9$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	697.9	0.9917	-0.0017	0.0154	0.00019	0.00065	-0.00112	0.00047
40	717.9	0.5790	-0.0016	-0.0060	0.00015	0.00089	-0.00123	0.00034
60	737.9	0.4342	-0.0016	-0.0231	0.00015	0.00101	-0.00129	0.00027
80	757.9	0.4061	-0.0018	-0.0369	0.00017	0.00109	-0.00132	0.00024
100	777.9	0.4254	-0.0019	-0.0485	0.00021	0.00114	-0.00135	0.00021
120	797.9	0.4641	-0.0017	-0.0586	0.00026	0.00117	-0.00137	0.00020
140	817.9	0.5099	-0.0012	-0.0674	0.00031	0.00120	-0.00140	0.00020
160	837.9	0.5573	-0.0004	-0.0750	0.00038	0.00121	-0.00142	0.00021
180	857.9	0.6037	0.0007	-0.0813	0.00044	0.00122	-0.00145	0.00023
200	877.9	0.6478	0.0021	-0.0862	0.00051	0.00122	-0.00148	0.00025
250	927.9	0.7458	0.0062	-0.0928	0.00071	0.00120	-0.00154	0.00034
300	977.9	0.8267	0.0109	-0.0918	0.00091	0.00114	-0.00160	0.00046
350	1027.9	0.8930	0.0156	-0.0847	0.00112	0.00106	-0.00165	0.00058
400	1077.9	0.9476	0.0200	-0.0731	0.00132	0.00098	-0.00168	0.00070
450	1127.9	0.9927	0.0240	-0.0582	0.00151	0.00090	-0.00169	0.00079
500	1177.9	1.0302	0.0277	-0.0413	0.00168	0.00081	-0.00168	0.00086
600	1277.9	1.0878	0.0341	-0.0038	0.00197	0.00067	-0.00159	0.00092
700	1377.9	1.1284	0.0393	0.0358	0.00218	0.00056	-0.00142	0.00087
800	1477.9	1.1571	0.0439	0.0757	0.00233	0.00048	-0.00117	0.00069
900	1577.9	1.1773	0.0479	0.1153	0.00241	0.00044	-0.00085	0.00041
1000	1677.9	1.1911	0.0516	0.1540	0.00244	0.00043	-0.00047	0.00004
1100	1777.9	1.2000	0.0550	0.1918	0.00243	0.00045	-0.00003	-0.00042
1200	1877.9	1.2053	0.0583	0.2286	0.00238	0.00050	0.00046	-0.00096
1300	1977.9	1.2076	0.0614	0.2644	0.00230	0.00057	0.00099	-0.00156
1400	2077.9	1.2078	0.0645	0.2991	0.00219	0.00065	0.00157	-0.00222
1500	2177.9	1.2061	0.0675	0.3329	0.00205	0.00076	0.00218	-0.00294
1600	2277.9	1.2030	0.0705	0.3656	0.00189	0.00087	0.00283	-0.00370
1700	2377.9	1.1988	0.0735	0.3974	0.00170	0.00101	0.00350	-0.00451
1800	2477.9	1.1937	0.0765	0.4284	0.00150	0.00115	0.00421	-0.00536
1900	2577.9	1.1878	0.0795	0.4584	0.00128	0.00130	0.00495	-0.00625
2000	2677.9	1.1814	0.0825	0.4876	0.00104	0.00146	0.00571	-0.00717
2500	3177.9	1.1437	0.0975	0.6219	-0.00041	0.00238	0.00986	-0.01224
3000	3677.9	1.1024	0.1128	0.7394	-0.00220	0.00341	0.01448	-0.01789
3500	4177.9	1.0608	0.1281	0.8426	-0.00429	0.00450	0.01948	-0.02398
4000	4677.9	1.0205	0.1436	0.9338	-0.00665	0.00560	0.02479	-0.03040
4500	5177.9	0.9820	0.1589	1.0145	-0.00923	0.00670	0.03034	-0.03704
5000	5677.9	0.9454	0.1741	1.0861	-0.01201	0.00776	0.03608	-0.04384

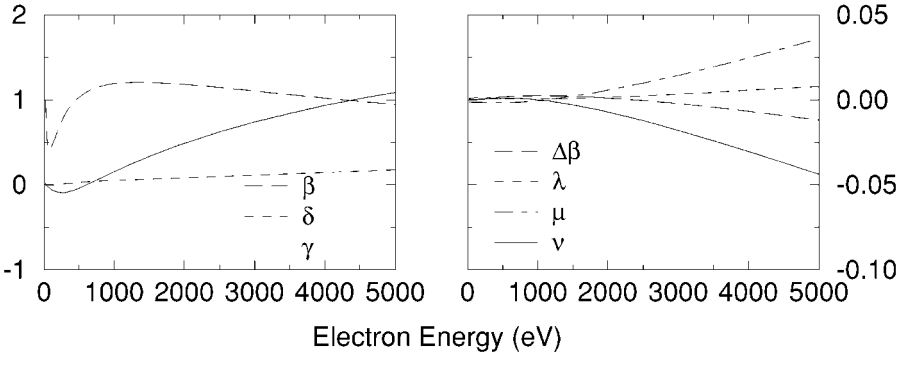

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4s$ shell of Xe $\quad E_b = 217.7$ (eV) $\quad$ (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	237.7	1.9215	0.1712	-0.00281	0.00173	0.00251	-0.00423
40	257.7	1.9326	0.2415	0.00124	-0.00035	-0.00040	0.00075
60	277.7	1.9407	0.2868	0.00096	-0.00002	0.00007	-0.00005
80	297.7	1.9467	0.3184	0.00030	0.00052	0.00082	-0.00134
100	317.7	1.9513	0.3410	-0.00018	0.00095	0.00143	-0.00238
120	337.7	1.9548	0.3573	-0.00043	0.00124	0.00184	-0.00308
140	357.7	1.9577	0.3690	-0.00048	0.00142	0.00209	-0.00351
160	377.7	1.9600	0.3773	-0.00040	0.00151	0.00222	-0.00373
180	397.7	1.9619	0.3830	-0.00021	0.00154	0.00226	-0.00380
200	417.7	1.9635	0.3866	0.00003	0.00153	0.00225	-0.00378
250	467.7	1.9666	0.3891	0.00077	0.00140	0.00207	-0.00347
300	517.7	1.9688	0.3853	0.00154	0.00122	0.00182	-0.00304
350	567.7	1.9704	0.3775	0.00224	0.00105	0.00158	-0.00262
400	617.7	1.9717	0.3670	0.00283	0.00091	0.00138	-0.00229
450	667.7	1.9727	0.3548	0.00330	0.00081	0.00126	-0.00207
500	717.7	1.9735	0.3414	0.00366	0.00076	0.00119	-0.00195
600	817.7	1.9747	0.3124	0.00403	0.00080	0.00125	-0.00205
700	917.7	1.9757	0.2822	0.00402	0.00098	0.00151	-0.00249
800	1017.7	1.9764	0.2518	0.00373	0.00127	0.00192	-0.00319
900	1117.7	1.9771	0.2221	0.00323	0.00163	0.00243	-0.00406
1000	1217.7	1.9777	0.1933	0.00257	0.00204	0.00301	-0.00505
1100	1317.7	1.9782	0.1659	0.00182	0.00247	0.00362	-0.00608
1200	1417.7	1.9787	0.1399	0.00100	0.00290	0.00423	-0.00713
1300	1517.7	1.9792	0.1154	0.00017	0.00333	0.00483	-0.00816
1400	1617.7	1.9797	0.0925	-0.00068	0.00374	0.00541	-0.00915
1500	1717.7	1.9801	0.0711	-0.00151	0.00413	0.00596	-0.01009
1600	1817.7	1.9805	0.0513	-0.00231	0.00449	0.00646	-0.01095
1700	1917.7	1.9809	0.0329	-0.00307	0.00482	0.00693	-0.01174
1800	2017.7	1.9814	0.0160	-0.00379	0.00511	0.00734	-0.01246
1900	2117.7	1.9818	0.0005	-0.00446	0.00538	0.00772	-0.01309
2000	2217.7	1.9821	-0.0137	-0.00508	0.00561	0.00804	-0.01365
2500	2717.7	1.9839	-0.0671	-0.00745	0.00632	0.00905	-0.01538
3000	3217.7	1.9854	-0.0963	-0.00872	0.00646	0.00924	-0.01569
3500	3717.7	1.9867	-0.1072	-0.00917	0.00621	0.00888	-0.01509
4000	4217.7	1.9877	-0.1041	-0.00907	0.00573	0.00820	-0.01393
4500	4717.7	1.9885	-0.0902	-0.00858	0.00514	0.00736	-0.01250
5000	5217.7	1.9891	-0.0677	-0.00784	0.00450	0.00644	-0.01095

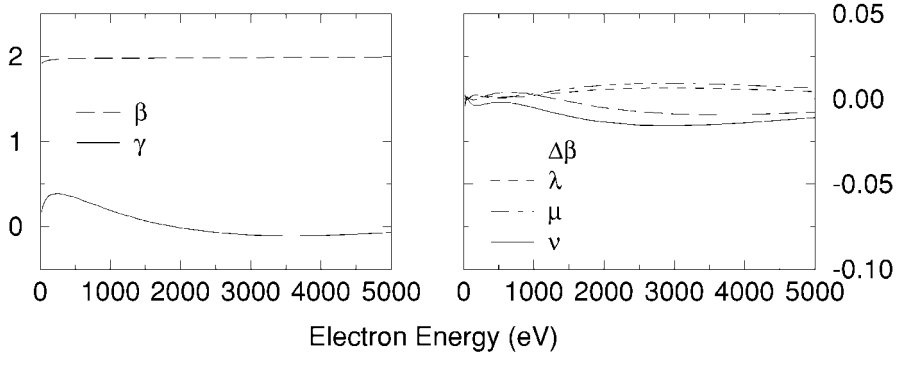

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4p_{1/2}$ shell of Xe $\quad E_b = 163.9$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	183.9	-0.1320	0.0624	-0.1017	0.00573	-0.00440	0.00685	-0.00245
40	203.9	-0.3940	-0.0716	0.4068	0.00146	-0.00033	0.00273	-0.00240
60	223.9	-0.2741	-0.0156	0.0696	-0.00015	-0.00031	0.00145	-0.00114
80	243.9	-0.0411	0.0234	-0.0816	-0.00092	-0.00024	0.00109	-0.00085
100	263.9	0.1954	0.0416	-0.0962	-0.00108	0.00002	0.00103	-0.00105
120	283.9	0.4031	0.0477	-0.0522	-0.00085	0.00026	0.00102	-0.00127
140	303.9	0.5773	0.0478	0.0087	-0.00042	0.00040	0.00097	-0.00137
160	323.9	0.7217	0.0452	0.0685	0.00011	0.00044	0.00090	-0.00133
180	343.9	0.8415	0.0415	0.1208	0.00064	0.00040	0.00080	-0.00120
200	363.9	0.9416	0.0375	0.1636	0.00113	0.00031	0.00071	-0.00102
250	413.9	1.1295	0.0283	0.2336	0.00205	0.00002	0.00057	-0.00059
300	463.9	1.2583	0.0210	0.2640	0.00248	-0.00021	0.00063	-0.00042
350	513.9	1.3508	0.0156	0.2698	0.00253	-0.00031	0.00086	-0.00055
400	563.9	1.4197	0.0116	0.2609	0.00230	-0.00028	0.00119	-0.00091
450	613.9	1.4724	0.0086	0.2434	0.00190	-0.00016	0.00158	-0.00142
500	663.9	1.5137	0.0063	0.2215	0.00142	0.00001	0.00198	-0.00200
600	763.9	1.5731	0.0033	0.1729	0.00038	0.00041	0.00273	-0.00314
700	863.9	1.6126	0.0015	0.1260	-0.00061	0.00079	0.00332	-0.00411
800	963.9	1.6397	0.0003	0.0848	-0.00146	0.00109	0.00375	-0.00483
900	1063.9	1.6584	-0.0003	0.0508	-0.00215	0.00129	0.00402	-0.00531
1000	1163.9	1.6714	-0.0008	0.0239	-0.00270	0.00141	0.00416	-0.00557
1100	1263.9	1.6803	-0.0010	0.0039	-0.00310	0.00145	0.00421	-0.00566
1200	1363.9	1.6860	-0.0012	-0.0101	-0.00338	0.00143	0.00418	-0.00561
1300	1463.9	1.6894	-0.0012	-0.0188	-0.00357	0.00136	0.00409	-0.00545
1400	1563.9	1.6910	-0.0012	-0.0229	-0.00366	0.00126	0.00395	-0.00521
1500	1663.9	1.6912	-0.0012	-0.0230	-0.00368	0.00112	0.00379	-0.00492
1600	1763.9	1.6903	-0.0011	-0.0196	-0.00364	0.00097	0.00362	-0.00459
1700	1863.9	1.6885	-0.0010	-0.0135	-0.00355	0.00081	0.00343	-0.00424
1800	1963.9	1.6859	-0.0008	-0.0048	-0.00342	0.00063	0.00325	-0.00388
1900	2063.9	1.6828	-0.0006	0.0058	-0.00326	0.00046	0.00307	-0.00353
2000	2163.9	1.6791	-0.0004	0.0182	-0.00308	0.00029	0.00290	-0.00319
2500	2663.9	1.6564	0.0012	0.0974	-0.00197	-0.00045	0.00230	-0.00184
3000	3163.9	1.6299	0.0033	0.1911	-0.00085	-0.00093	0.00221	-0.00128
3500	3663.9	1.6024	0.0060	0.2888	0.00008	-0.00111	0.00265	-0.00155
4000	4163.9	1.5750	0.0091	0.3858	0.00076	-0.00103	0.00359	-0.00256
4500	4663.9	1.5482	0.0125	0.4801	0.00119	-0.00073	0.00495	-0.00422
5000	5163.9	1.5222	0.0162	0.5709	0.00138	-0.00024	0.00668	-0.00644

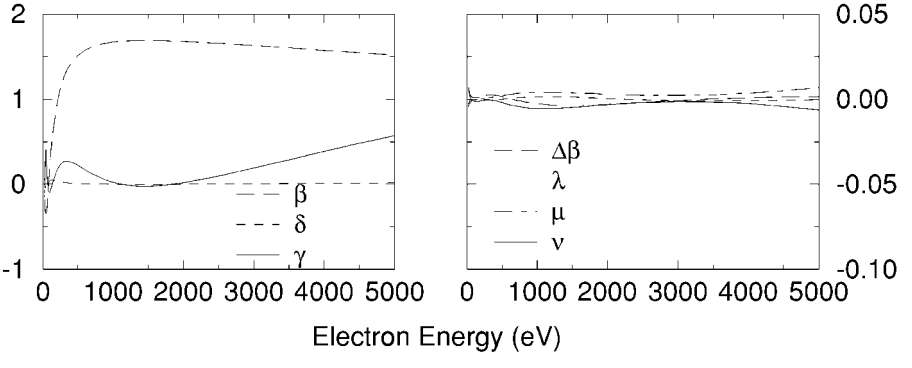

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4p_{3/2}$ shell of Xe $\quad E_b = 156.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	176.5	-0.5825	0.0761	-0.0729	0.00389	-0.00352	0.00464	-0.00111
40	196.5	-0.5230	-0.0476	0.2288	0.00066	-0.00041	0.00160	-0.00119
60	216.5	-0.2609	-0.0021	-0.0123	-0.00048	-0.00035	0.00083	-0.00048
80	236.5	0.0119	0.0283	-0.0957	-0.00096	-0.00022	0.00066	-0.00044
100	256.5	0.2482	0.0420	-0.0842	-0.00097	0.00003	0.00065	-0.00068
120	276.5	0.4434	0.0463	-0.0366	-0.00071	0.00026	0.00063	-0.00089
140	296.5	0.6031	0.0458	0.0186	-0.00030	0.00040	0.00058	-0.00097
160	316.5	0.7346	0.0432	0.0700	0.00016	0.00046	0.00049	-0.00094
180	336.5	0.8439	0.0397	0.1138	0.00061	0.00044	0.00039	-0.00083
200	356.5	0.9356	0.0359	0.1492	0.00101	0.00039	0.00029	-0.00068
250	406.5	1.1104	0.0273	0.2060	0.00171	0.00019	0.00016	-0.00035
300	456.5	1.2333	0.0203	0.2295	0.00199	0.00004	0.00021	-0.00025
350	506.5	1.3238	0.0151	0.2322	0.00193	0.00001	0.00040	-0.00041
400	556.5	1.3929	0.0111	0.2224	0.00165	0.00008	0.00069	-0.00077
450	606.5	1.4471	0.0082	0.2055	0.00123	0.00023	0.00103	-0.00125
500	656.5	1.4905	0.0060	0.1848	0.00075	0.00043	0.00136	-0.00179
600	756.5	1.5551	0.0032	0.1396	-0.00024	0.00088	0.00198	-0.00286
700	856.5	1.6001	0.0016	0.0964	-0.00115	0.00131	0.00244	-0.00375
800	956.5	1.6325	0.0009	0.0589	-0.00190	0.00168	0.00275	-0.00442
900	1056.5	1.6563	0.0006	0.0283	-0.00250	0.00195	0.00291	-0.00486
1000	1156.5	1.6739	0.0005	0.0046	-0.00296	0.00215	0.00296	-0.00511
1100	1256.5	1.6871	0.0006	-0.0126	-0.00328	0.00228	0.00291	-0.00519
1200	1356.5	1.6968	0.0009	-0.0239	-0.00349	0.00235	0.00280	-0.00514
1300	1456.5	1.7039	0.0012	-0.0301	-0.00360	0.00237	0.00263	-0.00500
1400	1556.5	1.7089	0.0015	-0.0319	-0.00363	0.00235	0.00243	-0.00478
1500	1656.5	1.7122	0.0018	-0.0298	-0.00360	0.00231	0.00220	-0.00452
1600	1756.5	1.7142	0.0022	-0.0244	-0.00351	0.00226	0.00197	-0.00422
1700	1856.5	1.7150	0.0026	-0.0162	-0.00338	0.00219	0.00173	-0.00391
1800	1956.5	1.7149	0.0030	-0.0057	-0.00322	0.00211	0.00149	-0.00360
1900	2056.5	1.7141	0.0034	0.0068	-0.00303	0.00203	0.00126	-0.00330
2000	2156.5	1.7126	0.0038	0.0210	-0.00282	0.00196	0.00105	-0.00300
2500	2656.5	1.6987	0.0059	0.1084	-0.00166	0.00170	0.00023	-0.00193
3000	3156.5	1.6786	0.0083	0.2095	-0.00057	0.00174	-0.00006	-0.00168
3500	3656.5	1.6556	0.0109	0.3141	0.00028	0.00209	0.00021	-0.00229
4000	4156.5	1.6314	0.0138	0.4176	0.00085	0.00272	0.00096	-0.00368
4500	4656.5	1.6069	0.0169	0.5180	0.00114	0.00360	0.00214	-0.00574
5000	5156.5	1.5824	0.0202	0.6144	0.00118	0.00469	0.00369	-0.00837

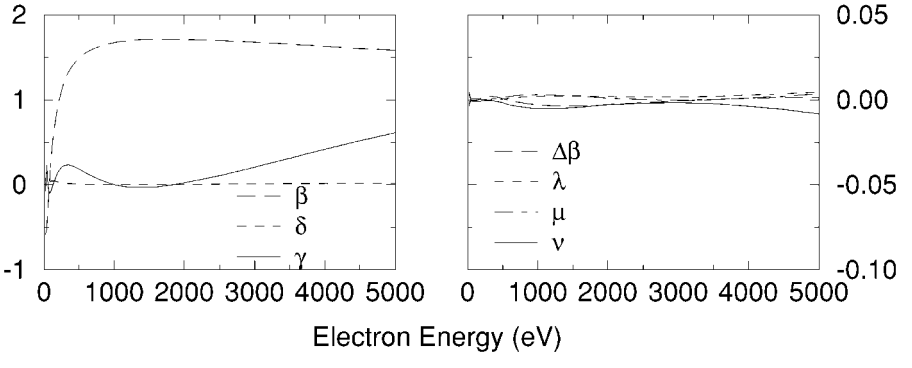

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4d_{3/2}$ shell of Xe $\quad E_b = 69.5$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	89.5	0.4652	0.0000	-0.0081	0.00002	0.00001	-0.00004	0.00002
40	109.5	1.1878	-0.0057	-0.0397	0.00010	0.00000	-0.00006	0.00006
60	129.5	1.8513	-0.0001	-0.1773	0.00049	-0.00033	0.00004	0.00030
80	149.5	1.3822	0.0593	-0.4328	0.00161	-0.00210	0.00107	0.00102
100	169.5	-0.5841	0.1054	-0.2608	0.00167	-0.00347	0.00257	0.00090
120	189.5	-0.7987	0.0724	0.0003	0.00070	-0.00262	0.00251	0.00011
140	209.5	-0.4664	0.0441	0.0950	0.00010	-0.00186	0.00222	-0.00037
160	229.5	-0.1631	0.0268	0.1225	-0.00024	-0.00136	0.00202	-0.00066
180	249.5	0.0696	0.0159	0.1249	-0.00047	-0.00101	0.00187	-0.00086
200	269.5	0.2487	0.0087	0.1166	-0.00064	-0.00075	0.00176	-0.00100
250	319.5	0.5544	-0.0007	0.0809	-0.00092	-0.00031	0.00154	-0.00123
300	369.5	0.7482	-0.0036	0.0437	-0.00108	-0.00002	0.00134	-0.00132
350	419.5	0.8826	-0.0035	0.0133	-0.00114	0.00017	0.00115	-0.00132
400	469.5	0.9813	-0.0019	-0.0088	-0.00114	0.00028	0.00098	-0.00126
450	519.5	1.0564	0.0004	-0.0230	-0.00110	0.00034	0.00081	-0.00115
500	569.5	1.1151	0.0031	-0.0305	-0.00101	0.00036	0.00066	-0.00102
600	669.5	1.1992	0.0085	-0.0304	-0.00077	0.00030	0.00041	-0.00071
700	769.5	1.2544	0.0135	-0.0163	-0.00049	0.00018	0.00024	-0.00042
800	869.5	1.2913	0.0180	0.0064	-0.00021	0.00003	0.00015	-0.00019
900	969.5	1.3158	0.0221	0.0345	0.00005	-0.00012	0.00016	-0.00004
1000	1069.5	1.3316	0.0258	0.0660	0.00028	-0.00027	0.00025	0.00002
1100	1169.5	1.3410	0.0292	0.0993	0.00047	-0.00040	0.00042	-0.00003
1200	1269.5	1.3456	0.0324	0.1337	0.00063	-0.00050	0.00067	-0.00017
1300	1369.5	1.3467	0.0355	0.1686	0.00075	-0.00059	0.00099	-0.00041
1400	1469.5	1.3450	0.0384	0.2034	0.00083	-0.00065	0.00138	-0.00073
1500	1569.5	1.3412	0.0413	0.2380	0.00087	-0.00068	0.00182	-0.00114
1600	1669.5	1.3358	0.0441	0.2721	0.00089	-0.00070	0.00232	-0.00163
1700	1769.5	1.3291	0.0469	0.3055	0.00087	-0.00069	0.00287	-0.00218
1800	1869.5	1.3214	0.0496	0.3382	0.00082	-0.00067	0.00347	-0.00279
1900	1969.5	1.3130	0.0524	0.3702	0.00074	-0.00063	0.00410	-0.00347
2000	2069.5	1.3039	0.0551	0.4013	0.00064	-0.00058	0.00477	-0.00419
2500	2569.5	1.2540	0.0690	0.5447	-0.00021	-0.00016	0.00859	-0.00844
3000	3069.5	1.2023	0.0831	0.6692	-0.00150	0.00043	0.01300	-0.01343
3500	3569.5	1.1524	0.0975	0.7780	-0.00315	0.00109	0.01784	-0.01893
4000	4069.5	1.1054	0.1119	0.8740	-0.00508	0.00177	0.02301	-0.02478
4500	4569.5	1.0616	0.1264	0.9593	-0.00725	0.00246	0.02845	-0.03091
5000	5069.5	1.0208	0.1408	1.0355	-0.00962	0.00313	0.03412	-0.03725

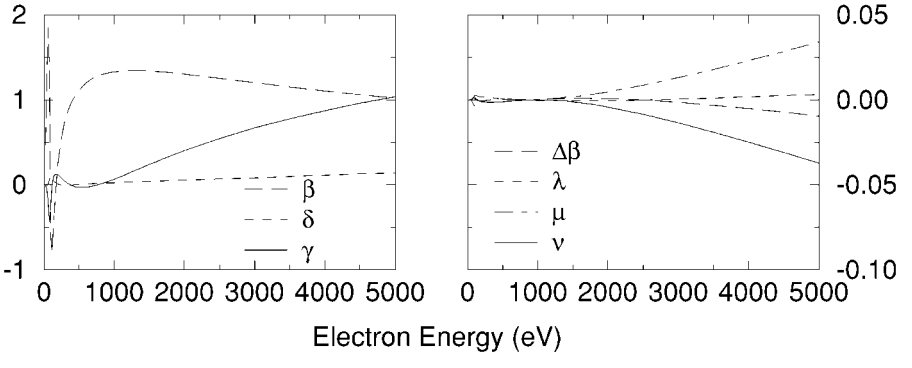

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$4d_{5/2}$ shell of Xe $\quad E_b = 67.6$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	87.6	0.4894	0.0001	-0.0082	0.00002	0.00011	-0.00014	0.00002
40	107.6	1.2575	-0.0057	-0.0416	0.00010	0.00009	-0.00014	0.00006
60	127.6	1.9083	0.0004	-0.1847	0.00051	-0.00035	0.00003	0.00031
80	147.6	1.2137	0.0614	-0.4160	0.00168	-0.00236	0.00133	0.00103
100	167.6	-0.6848	0.0950	-0.1785	0.00150	-0.00327	0.00257	0.00070
120	187.6	-0.6989	0.0618	0.0494	0.00055	-0.00221	0.00226	-0.00005
140	207.6	-0.3340	0.0370	0.1196	0.00002	-0.00143	0.00191	-0.00048
160	227.6	-0.0339	0.0221	0.1348	-0.00030	-0.00095	0.00168	-0.00074
180	247.6	0.1902	0.0128	0.1303	-0.00051	-0.00061	0.00152	-0.00092
200	267.6	0.3606	0.0067	0.1179	-0.00067	-0.00035	0.00139	-0.00105
250	317.6	0.6482	-0.0011	0.0772	-0.00093	0.00011	0.00113	-0.00124
300	367.6	0.8280	-0.0034	0.0386	-0.00108	0.00042	0.00089	-0.00131
350	417.6	0.9511	-0.0030	0.0084	-0.00113	0.00063	0.00066	-0.00129
400	467.6	1.0401	-0.0013	-0.0126	-0.00113	0.00077	0.00045	-0.00122
450	517.6	1.1070	0.0009	-0.0254	-0.00107	0.00086	0.00024	-0.00110
500	567.6	1.1583	0.0035	-0.0315	-0.00098	0.00092	0.00004	-0.00096
600	667.6	1.2300	0.0086	-0.0284	-0.00074	0.00095	-0.00029	-0.00066
700	767.6	1.2750	0.0134	-0.0118	-0.00046	0.00092	-0.00054	-0.00038
800	867.6	1.3033	0.0178	0.0130	-0.00017	0.00088	-0.00071	-0.00017
900	967.6	1.3205	0.0217	0.0428	0.00009	0.00083	-0.00079	-0.00005
1000	1067.6	1.3299	0.0254	0.0754	0.00031	0.00080	-0.00078	-0.00002
1100	1167.6	1.3337	0.0289	0.1096	0.00050	0.00079	-0.00068	-0.00011
1200	1267.6	1.3334	0.0322	0.1446	0.00065	0.00080	-0.00051	-0.00029
1300	1367.6	1.3301	0.0353	0.1797	0.00077	0.00084	-0.00027	-0.00056
1400	1467.6	1.3245	0.0384	0.2147	0.00084	0.00089	0.00003	-0.00093
1500	1567.6	1.3172	0.0415	0.2492	0.00088	0.00098	0.00040	-0.00137
1600	1667.6	1.3086	0.0445	0.2830	0.00088	0.00108	0.00081	-0.00189
1700	1767.6	1.2990	0.0476	0.3161	0.00086	0.00120	0.00128	-0.00248
1800	1867.6	1.2887	0.0506	0.3483	0.00080	0.00134	0.00179	-0.00313
1900	1967.6	1.2779	0.0536	0.3797	0.00072	0.00149	0.00234	-0.00383
2000	2067.6	1.2667	0.0567	0.4102	0.00060	0.00166	0.00293	-0.00458
2500	2567.6	1.2086	0.0721	0.5496	-0.00029	0.00262	0.00632	-0.00894
3000	3067.6	1.1517	0.0880	0.6697	-0.00165	0.00370	0.01029	-0.01400
3500	3567.6	1.0985	0.1040	0.7740	-0.00337	0.00483	0.01470	-0.01952
4000	4067.6	1.0495	0.1201	0.8658	-0.00537	0.00594	0.01944	-0.02538
4500	4567.6	1.0045	0.1362	0.9473	-0.00761	0.00703	0.02447	-0.03150
5000	5067.6	0.9632	0.1521	1.0201	-0.01006	0.00808	0.02974	-0.03782

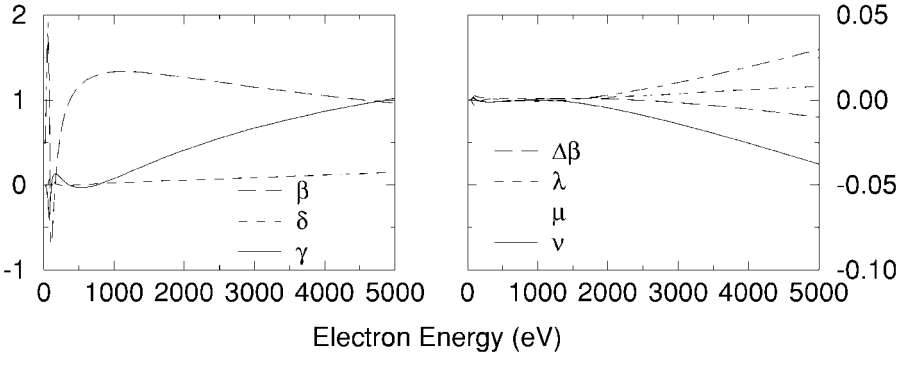

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$5s$ shell of Xe $E_b = 23.4$ (eV) (δ negligible for ns shells)

E (eV)	ω (eV)	β	γ	$\Delta\beta$	λ	μ	ν
20	43.4	1.4808	-0.3312	0.00042	0.00061	0.00090	-0.00151
40	63.4	1.8435	-0.0497	0.00047	-0.00026	-0.00033	0.00059
60	83.4	1.9057	0.0634	0.00061	-0.00033	-0.00042	0.00074
80	103.4	1.9295	0.1300	0.00041	-0.00012	-0.00013	0.00026
100	123.4	1.9420	0.1755	0.00017	0.00013	0.00022	-0.00035
120	143.4	1.9496	0.2089	-0.00002	0.00035	0.00054	-0.00089
140	163.4	1.9548	0.2341	-0.00012	0.00053	0.00079	-0.00132
160	183.4	1.9585	0.2536	-0.00014	0.00066	0.00097	-0.00163
180	203.4	1.9613	0.2687	-0.00008	0.00074	0.00110	-0.00184
200	223.4	1.9634	0.2805	0.00002	0.00080	0.00118	-0.00197
250	273.4	1.9672	0.2993	0.00045	0.00083	0.00122	-0.00205
300	323.4	1.9697	0.3080	0.00098	0.00078	0.00116	-0.00194
350	373.4	1.9715	0.3100	0.00151	0.00070	0.00106	-0.00177
400	423.4	1.9727	0.3077	0.00199	0.00063	0.00097	-0.00161
450	473.4	1.9737	0.3024	0.00240	0.00059	0.00091	-0.00150
500	523.4	1.9745	0.2949	0.00272	0.00057	0.00089	-0.00146
600	623.4	1.9757	0.2757	0.00313	0.00062	0.00098	-0.00160
700	723.4	1.9766	0.2532	0.00323	0.00079	0.00122	-0.00201
800	823.4	1.9773	0.2290	0.00309	0.00105	0.00159	-0.00263
900	923.4	1.9779	0.2042	0.00274	0.00137	0.00204	-0.00341
1000	1023.4	1.9784	0.1795	0.00225	0.00173	0.00256	-0.00430
1100	1123.4	1.9789	0.1552	0.00165	0.00213	0.00312	-0.00525
1200	1223.4	1.9793	0.1318	0.00097	0.00253	0.00369	-0.00622
1300	1323.4	1.9797	0.1094	0.00025	0.00293	0.00426	-0.00719
1400	1423.4	1.9802	0.0881	-0.00049	0.00333	0.00481	-0.00814
1500	1523.4	1.9805	0.0680	-0.00124	0.00370	0.00534	-0.00905
1600	1623.4	1.9809	0.0492	-0.00198	0.00405	0.00584	-0.00990
1700	1723.4	1.9813	0.0317	-0.00269	0.00438	0.00630	-0.01068
1800	1823.4	1.9817	0.0155	-0.00338	0.00468	0.00673	-0.01141
1900	1923.4	1.9821	0.0005	-0.00402	0.00495	0.00711	-0.01206
2000	2023.4	1.9824	-0.0133	-0.00463	0.00519	0.00744	-0.01263
2500	2523.4	1.9841	-0.0655	-0.00699	0.00597	0.00854	-0.01451
3000	3023.4	1.9855	-0.0944	-0.00831	0.00617	0.00882	-0.01499
3500	3523.4	1.9868	-0.1052	-0.00882	0.00597	0.00854	-0.01451
4000	4023.4	1.9878	-0.1023	-0.00876	0.00554	0.00793	-0.01347
4500	4523.4	1.9885	-0.0888	-0.00831	0.00498	0.00713	-0.01211
5000	5023.4	1.9891	-0.0667	-0.00763	0.00438	0.00627	-0.01065

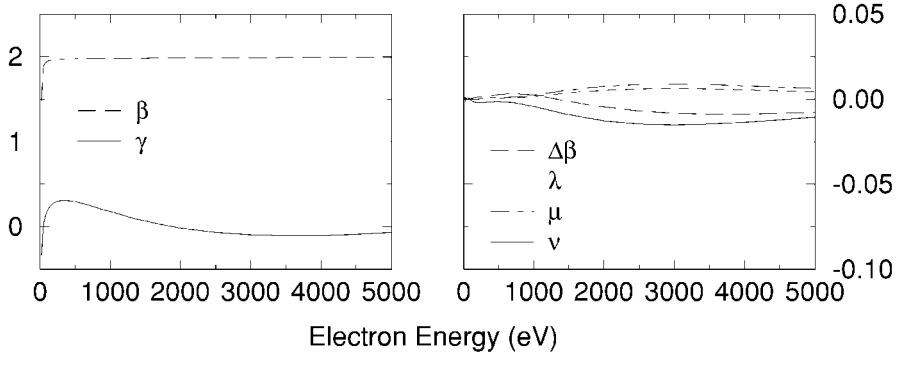

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$5p_{1/2}$ shell of Xe $\quad E_b = 13.4$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	33.4	1.8426	-0.0027	0.0191	-0.00008	0.00006	0.00008	-0.00014
40	53.4	1.2200	-0.0228	0.2497	0.00005	0.00038	0.00065	-0.00103
60	73.4	0.4160	-0.0241	0.2793	0.00032	0.00051	0.00086	-0.00137
80	93.4	-0.0141	-0.0054	0.1129	0.00033	0.00032	0.00059	-0.00091
100	113.4	-0.0422	0.0132	-0.0171	0.00010	0.00022	0.00037	-0.00060
120	133.4	0.1161	0.0239	-0.0557	-0.00008	0.00029	0.00032	-0.00060
140	153.4	0.3179	0.0280	-0.0369	-0.00010	0.00039	0.00034	-0.00073
160	173.4	0.5080	0.0284	0.0057	0.00003	0.00046	0.00036	-0.00082
180	193.4	0.6719	0.0270	0.0536	0.00027	0.00048	0.00036	-0.00084
200	213.4	0.8094	0.0247	0.0983	0.00057	0.00044	0.00035	-0.00079
250	263.4	1.0618	0.0185	0.1813	0.00129	0.00023	0.00031	-0.00053
300	313.4	1.2274	0.0133	0.2254	0.00179	0.00001	0.00035	-0.00036
350	363.4	1.3413	0.0093	0.2420	0.00198	-0.00012	0.00052	-0.00040
400	413.4	1.4231	0.0065	0.2413	0.00193	-0.00013	0.00078	-0.00065
450	463.4	1.4838	0.0044	0.2301	0.00171	-0.00006	0.00111	-0.00105
500	513.4	1.5301	0.0028	0.2129	0.00138	0.00007	0.00147	-0.00154
600	613.4	1.5946	0.0009	0.1705	0.00058	0.00041	0.00216	-0.00257
700	713.4	1.6358	-0.0002	0.1270	-0.00025	0.00076	0.00275	-0.00350
800	813.4	1.6631	-0.0008	0.0875	-0.00101	0.00104	0.00320	-0.00424
900	913.4	1.6815	-0.0012	0.0541	-0.00166	0.00125	0.00351	-0.00476
1000	1013.4	1.6938	-0.0014	0.0272	-0.00219	0.00138	0.00370	-0.00509
1100	1113.4	1.7018	-0.0015	0.0066	-0.00261	0.00144	0.00380	-0.00524
1200	1213.4	1.7067	-0.0016	-0.0082	-0.00292	0.00144	0.00382	-0.00526
1300	1313.4	1.7093	-0.0016	-0.0177	-0.00314	0.00139	0.00378	-0.00517
1400	1413.4	1.7101	-0.0015	-0.0227	-0.00328	0.00130	0.00369	-0.00499
1500	1513.4	1.7095	-0.0015	-0.0237	-0.00335	0.00118	0.00357	-0.00476
1600	1613.4	1.7078	-0.0014	-0.0213	-0.00335	0.00104	0.00343	-0.00447
1700	1713.4	1.7053	-0.0013	-0.0159	-0.00331	0.00089	0.00328	-0.00417
1800	1813.4	1.7021	-0.0012	-0.0080	-0.00322	0.00073	0.00312	-0.00385
1900	1913.4	1.6983	-0.0010	0.0020	-0.00310	0.00056	0.00296	-0.00352
2000	2013.4	1.6941	-0.0008	0.0137	-0.00295	0.00040	0.00280	-0.00320
2500	2513.4	1.6689	0.0006	0.0908	-0.00198	-0.00033	0.00224	-0.00191
3000	3013.4	1.6404	0.0026	0.1833	-0.00093	-0.00080	0.00215	-0.00135
3500	3513.4	1.6113	0.0051	0.2803	-0.00002	-0.00101	0.00254	-0.00153
4000	4013.4	1.5826	0.0081	0.3769	0.00066	-0.00096	0.00343	-0.00247
4500	4513.4	1.5548	0.0114	0.4708	0.00109	-0.00067	0.00474	-0.00407
5000	5013.4	1.5279	0.0151	0.5612	0.00125	-0.00014	0.00646	-0.00632

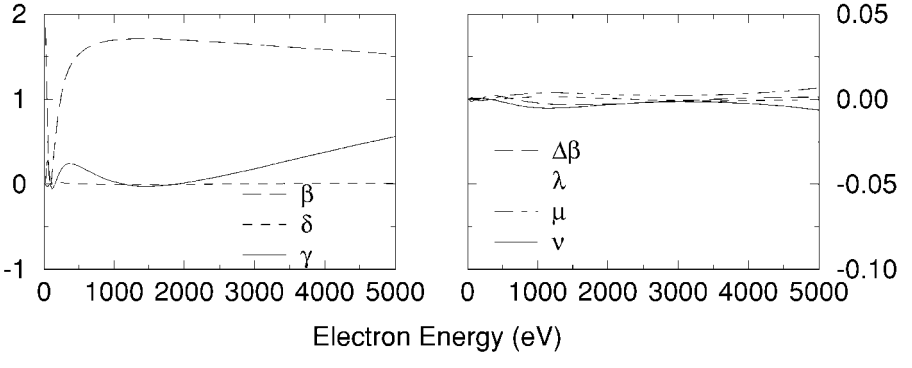

TABLE I. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Subshells of He, Ne, Ar, Kr, and Xe (20–5162 eV)

See page 162 for Explanation of Tables

$5p_{3/2}$ shell of Xe $\quad E_b = 12.1$ (eV)

E (eV)	ω (eV)	β	δ	γ	$\Delta\beta$	λ	μ	ν
20	32.1	1.8608	-0.0027	0.0148	-0.00009	0.00007	0.00009	-0.00015
40	52.1	0.9115	-0.0289	0.2691	0.00014	0.00039	0.00068	-0.00107
60	72.1	0.0492	-0.0258	0.2142	0.00035	0.00040	0.00067	-0.00107
80	92.1	-0.1447	-0.0026	0.0366	0.00020	0.00018	0.00036	-0.00054
100	112.1	-0.0043	0.0152	-0.0485	-0.00005	0.00014	0.00022	-0.00035
120	132.1	0.2102	0.0243	-0.0540	-0.00016	0.00022	0.00020	-0.00042
140	152.1	0.4128	0.0276	-0.0229	-0.00012	0.00033	0.00022	-0.00055
160	172.1	0.5854	0.0278	0.0197	0.00004	0.00040	0.00022	-0.00062
180	192.1	0.7285	0.0265	0.0620	0.00028	0.00043	0.00020	-0.00062
200	212.1	0.8471	0.0245	0.0996	0.00055	0.00041	0.00016	-0.00057
250	262.1	1.0661	0.0187	0.1666	0.00114	0.00027	0.00008	-0.00035
300	312.1	1.2136	0.0137	0.2004	0.00149	0.00013	0.00010	-0.00023
350	362.1	1.3186	0.0098	0.2115	0.00157	0.00006	0.00024	-0.00030
400	412.1	1.3964	0.0069	0.2082	0.00144	0.00009	0.00047	-0.00056
450	462.1	1.4561	0.0047	0.1962	0.00117	0.00020	0.00075	-0.00095
500	512.1	1.5030	0.0031	0.1792	0.00082	0.00036	0.00105	-0.00141
600	612.1	1.5714	0.0011	0.1391	0.00001	0.00076	0.00161	-0.00237
700	712.1	1.6178	0.0002	0.0987	-0.00078	0.00116	0.00207	-0.00323
800	812.1	1.6505	-0.0002	0.0625	-0.00147	0.00151	0.00240	-0.00391
900	912.1	1.6741	-0.0003	0.0323	-0.00205	0.00179	0.00260	-0.00439
1000	1012.1	1.6914	-0.0002	0.0083	-0.00250	0.00200	0.00269	-0.00469
1100	1112.1	1.7040	0.0000	-0.0095	-0.00285	0.00214	0.00269	-0.00483
1200	1212.1	1.7132	0.0003	-0.0217	-0.00309	0.00222	0.00262	-0.00484
1300	1312.1	1.7197	0.0007	-0.0288	-0.00324	0.00226	0.00250	-0.00475
1400	1412.1	1.7241	0.0010	-0.0315	-0.00332	0.00226	0.00234	-0.00460
1500	1512.1	1.7269	0.0014	-0.0304	-0.00334	0.00224	0.00215	-0.00439
1600	1612.1	1.7283	0.0017	-0.0259	-0.00329	0.00219	0.00194	-0.00412
1700	1712.1	1.7286	0.0021	-0.0186	-0.00320	0.00213	0.00173	-0.00386
1800	1812.1	1.7281	0.0025	-0.0088	-0.00308	0.00206	0.00151	-0.00357
1900	1912.1	1.7268	0.0028	0.0030	-0.00292	0.00199	0.00129	-0.00329
2000	2012.1	1.7249	0.0032	0.0166	-0.00274	0.00192	0.00109	-0.00301
2500	2512.1	1.7091	0.0052	0.1018	-0.00169	0.00168	0.00029	-0.00197
3000	3012.1	1.6874	0.0075	0.2017	-0.00067	0.00172	0.00000	-0.00172
3500	3512.1	1.6632	0.0100	0.3055	0.00018	0.00203	0.00020	-0.00223
4000	4012.1	1.6380	0.0128	0.4085	0.00076	0.00262	0.00090	-0.00352
4500	4512.1	1.6126	0.0158	0.5085	0.00107	0.00347	0.00201	-0.00548
5000	5012.1	1.5875	0.0192	0.6046	0.00106	0.00462	0.00357	-0.00819

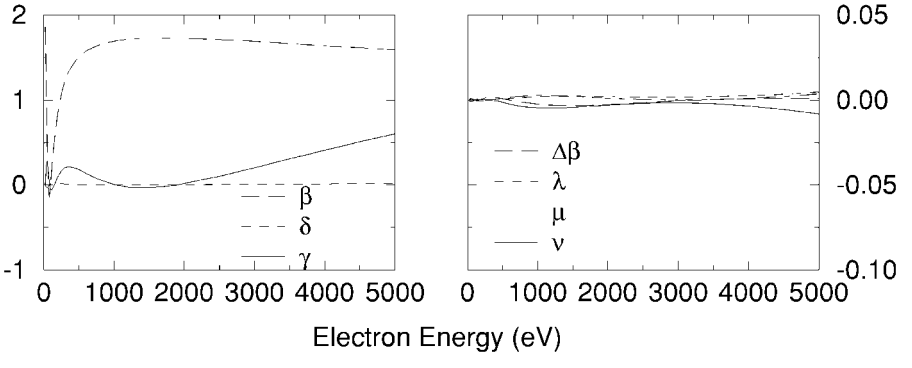

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Kr 3s shell E_b=293.1 (eV)				Kr 4s shell E_b = 27.5 (eV)			
E (eV)	ω (eV)	β	γ	E (eV)	ω (eV)	β	γ
2	295.1	1.9916	-0.0762	2	29.5	0.8412	-0.5721
3	296.1	1.9915	-0.0310	3	30.5	-0.0888	-0.1498
4	297.1	1.9913	0.0131	4	31.5	-0.9122	0.1079
5	298.1	1.9912	0.0542	5	32.5	-0.3144	-0.2380
6	299.1	1.9912	0.0911	6	33.5	0.6174	-0.5806
7	300.1	1.9911	0.1237	7	34.5	1.1652	-0.7097
8	301.1	1.9911	0.1521	8	35.5	1.4561	-0.7301
9	302.1	1.9910	0.1768	9	36.5	1.6197	-0.7066
10	303.1	1.9910	0.1983	10	37.5	1.7188	-0.6664
11	304.1	1.9910	0.2169	11	38.5	1.7829	-0.6209
12	305.1	1.9910	0.2332	12	39.5	1.8266	-0.5749
13	306.1	1.9910	0.2475	13	40.5	1.8576	-0.5305
14	307.1	1.9910	0.2601	14	41.5	1.8805	-0.4888
15	308.1	1.9910	0.2712	15	42.5	1.8979	-0.4499
16	309.1	1.9910	0.2812	16	43.5	1.9114	-0.4139
17	310.1	1.9910	0.2900	17	44.5	1.9222	-0.3807
18	311.1	1.9910	0.2980	18	45.5	1.9308	-0.3500
19	312.1	1.9910	0.3053	19	46.5	1.9380	-0.3216
20	313.1	1.9911	0.3118	20	47.5	1.9439	-0.2953
22	315.1	1.9911	0.3233	22	49.5	1.9531	-0.2484
24	317.1	1.9911	0.3330	24	51.5	1.9599	-0.2078
26	319.1	1.9912	0.3413	26	53.5	1.9650	-0.1724
28	321.1	1.9912	0.3485	28	55.5	1.9691	-0.1413
30	323.1	1.9912	0.3548	30	57.5	1.9723	-0.1137
32	325.1	1.9913	0.3604	32	59.5	1.9749	-0.0890
34	327.1	1.9913	0.3653	34	61.5	1.9770	-0.0669
36	329.1	1.9914	0.3697	36	63.5	1.9788	-0.0469
38	331.1	1.9914	0.3737	38	65.5	1.9804	-0.0287
40	333.1	1.9914	0.3773	40	67.5	1.9817	-0.0121
42	335.1	1.9915	0.3805	42	69.5	1.9828	0.0031
44	337.1	1.9915	0.3834	44	71.5	1.9838	0.0171
46	339.1	1.9915	0.3861	46	73.5	1.9846	0.0300
48	341.1	1.9916	0.3885	48	75.5	1.9854	0.0420
50	343.1	1.9916	0.3907	50	77.5	1.9861	0.0532
52	345.1	1.9916	0.3927	52	79.5	1.9867	0.0636
54	347.1	1.9917	0.3945	54	81.5	1.9872	0.0733
56	349.1	1.9917	0.3961	56	83.5	1.9877	0.0824
58	351.1	1.9917	0.3976	58	85.5	1.9882	0.0910
60	353.1	1.9918	0.3989	60	87.5	1.9886	0.0990

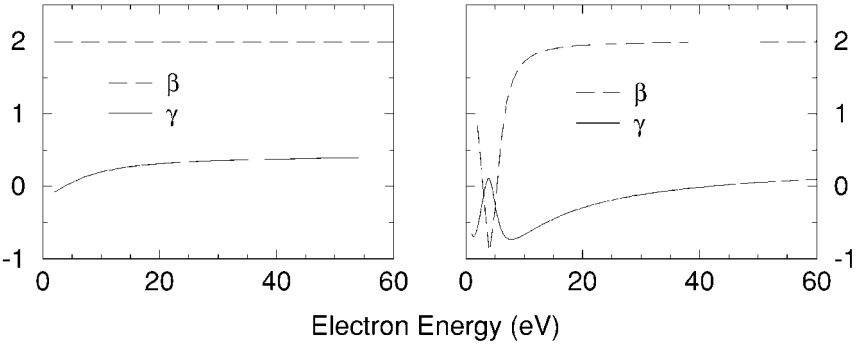

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Kr $3p_{1/2}$ shell $E_b = 222.4$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	224.4	0.2954	0.0247	0.0527
3	225.4	-0.0343	0.0261	0.0315
4	226.4	-0.2908	0.0278	0.0115
5	227.4	-0.4843	0.0297	-0.0067
6	228.4	-0.6267	0.0315	-0.0231
7	229.4	-0.7288	0.0334	-0.0377
8	230.4	-0.7995	0.0353	-0.0508
9	231.4	-0.8462	0.0372	-0.0627
10	232.4	-0.8745	0.0391	-0.0737
11	233.4	-0.8885	0.0410	-0.0838
12	234.4	-0.8916	0.0429	-0.0932
13	235.4	-0.8863	0.0449	-0.1020
14	236.4	-0.8746	0.0470	-0.1103
15	237.4	-0.8578	0.0491	-0.1181
16	238.4	-0.8373	0.0512	-0.1254
17	239.4	-0.8137	0.0533	-0.1322
18	240.4	-0.7879	0.0555	-0.1385
19	241.4	-0.7605	0.0576	-0.1443
20	242.4	-0.7318	0.0598	-0.1495
22	244.4	-0.6719	0.0641	-0.1585
24	246.4	-0.6104	0.0683	-0.1651
26	248.4	-0.5485	0.0722	-0.1694
28	250.4	-0.4872	0.0759	-0.1713
30	252.4	-0.4269	0.0792	-0.1709
32	254.4	-0.3681	0.0822	-0.1682
34	256.4	-0.3109	0.0847	-0.1635
36	258.4	-0.2554	0.0869	-0.1569
38	260.4	-0.2019	0.0886	-0.1487
40	262.4	-0.1501	0.0899	-0.1390
42	264.4	-0.1003	0.0909	-0.1281
44	266.4	-0.0522	0.0914	-0.1162
46	268.4	-0.0060	0.0917	-0.1036
48	270.4	0.0386	0.0917	-0.0904
50	272.4	0.0814	0.0914	-0.0769
52	274.4	0.1227	0.0908	-0.0631
54	276.4	0.1624	0.0901	-0.0493
56	278.4	0.2006	0.0891	-0.0355
58	280.4	0.2374	0.0881	-0.0218
60	282.4	0.2728	0.0869	-0.0084

Kr $3p_{3/2}$ shell $E_b = 214.8$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	216.8	0.3326	0.0222	0.0541
3	217.8	-0.0008	0.0235	0.0336
4	218.8	-0.2583	0.0252	0.0142
5	219.8	-0.4517	0.0271	-0.0033
6	220.8	-0.5938	0.0289	-0.0189
7	221.8	-0.6955	0.0308	-0.0328
8	222.8	-0.7661	0.0326	-0.0453
9	223.8	-0.8128	0.0345	-0.0567
10	224.8	-0.8411	0.0363	-0.0670
11	225.8	-0.8555	0.0381	-0.0765
12	226.8	-0.8590	0.0400	-0.0854
13	227.8	-0.8542	0.0419	-0.0936
14	228.8	-0.8430	0.0439	-0.1013
15	229.8	-0.8269	0.0459	-0.1086
16	230.8	-0.8070	0.0479	-0.1153
17	231.8	-0.7841	0.0499	-0.1216
18	232.8	-0.7591	0.0520	-0.1274
19	233.8	-0.7324	0.0540	-0.1327
20	234.8	-0.7044	0.0561	-0.1375
22	236.8	-0.6461	0.0602	-0.1457
24	238.8	-0.5861	0.0641	-0.1517
26	240.8	-0.5259	0.0679	-0.1555
28	242.8	-0.4661	0.0714	-0.1572
30	244.8	-0.4074	0.0746	-0.1567
32	246.8	-0.3501	0.0774	-0.1542
34	248.8	-0.2944	0.0798	-0.1498
36	250.8	-0.2405	0.0819	-0.1437
38	252.8	-0.1883	0.0836	-0.1360
40	254.8	-0.1379	0.0849	-0.1270
42	256.8	-0.0894	0.0859	-0.1170
44	258.8	-0.0426	0.0865	-0.1060
46	260.8	0.0025	0.0868	-0.0944
48	262.8	0.0458	0.0868	-0.0822
50	264.8	0.0876	0.0865	-0.0697
52	266.8	0.1278	0.0861	-0.0570
54	268.8	0.1665	0.0854	-0.0442
56	270.8	0.2038	0.0846	-0.0315
58	272.8	0.2397	0.0836	-0.0189
60	274.8	0.2742	0.0825	-0.0065

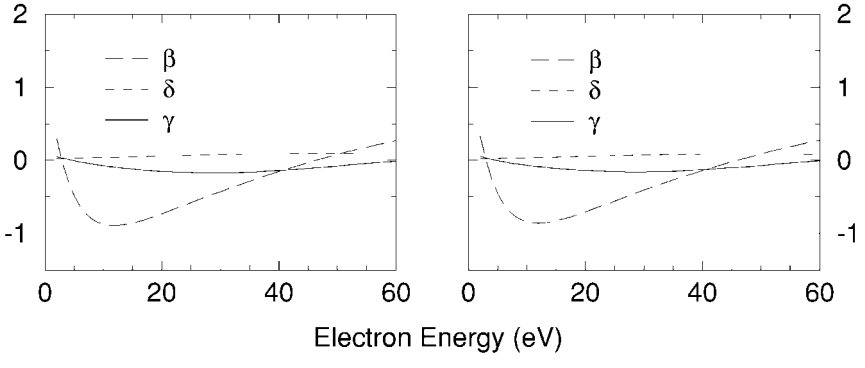

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Kr $3d_{3/2}$ shell $E_b = 95.4$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	97.4	0.7703	-0.0065	-0.0124
3	98.4	0.9046	-0.0042	-0.0093
4	99.4	1.0023	-0.0022	-0.0060
5	100.4	1.0675	-0.0004	-0.0029
6	101.4	1.1029	0.0011	-0.0002
7	102.4	1.1110	0.0023	0.0020
8	103.4	1.0949	0.0032	0.0036
9	104.4	1.0584	0.0040	0.0047
10	105.4	1.0058	0.0045	0.0053
11	106.4	0.9412	0.0050	0.0056
12	107.4	0.8688	0.0053	0.0055
13	108.4	0.7921	0.0055	0.0051
14	109.4	0.7143	0.0057	0.0046
15	110.4	0.6376	0.0059	0.0039
16	111.4	0.5640	0.0060	0.0031
17	112.4	0.4946	0.0061	0.0023
18	113.4	0.4304	0.0062	0.0014
19	114.4	0.3716	0.0063	0.0006
20	115.4	0.3185	0.0064	-0.0003
22	117.4	0.2289	0.0066	-0.0019
24	119.4	0.1597	0.0068	-0.0033
26	121.4	0.1080	0.0070	-0.0046
28	123.4	0.0710	0.0072	-0.0058
30	125.4	0.0460	0.0074	-0.0068
32	127.4	0.0305	0.0076	-0.0077
34	129.4	0.0226	0.0078	-0.0084
36	131.4	0.0208	0.0080	-0.0091
38	133.4	0.0237	0.0082	-0.0097
40	135.4	0.0302	0.0084	-0.0102
42	137.4	0.0397	0.0086	-0.0106
44	139.4	0.0514	0.0088	-0.0110
46	141.4	0.0648	0.0091	-0.0114
48	143.4	0.0795	0.0093	-0.0117
50	145.4	0.0951	0.0095	-0.0119
52	147.4	0.1115	0.0097	-0.0121
54	149.4	0.1283	0.0099	-0.0123
56	151.4	0.1455	0.0102	-0.0125
58	153.4	0.1628	0.0104	-0.0126
60	155.4	0.1802	0.0106	-0.0127

Kr $3d_{5/2}$ shell $E_b = 94.2$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	96.2	0.7768	-0.0060	-0.0116
3	97.2	0.9050	-0.0038	-0.0084
4	98.2	0.9956	-0.0017	-0.0051
5	99.2	1.0531	0.0000	-0.0022
6	100.2	1.0806	0.0015	0.0004
7	101.2	1.0808	0.0027	0.0024
8	102.2	1.0574	0.0036	0.0038
9	103.2	1.0145	0.0044	0.0047
10	104.2	0.9565	0.0049	0.0052
11	105.2	0.8877	0.0053	0.0053
12	106.2	0.8122	0.0056	0.0051
13	107.2	0.7337	0.0059	0.0047
14	108.2	0.6550	0.0060	0.0040
15	109.2	0.5785	0.0062	0.0033
16	110.2	0.5058	0.0063	0.0024
17	111.2	0.4381	0.0064	0.0016
18	112.2	0.3758	0.0065	0.0007
19	113.2	0.3195	0.0066	-0.0002
20	114.2	0.2690	0.0067	-0.0010
22	116.2	0.1851	0.0068	-0.0026
24	118.2	0.1217	0.0070	-0.0041
26	120.2	0.0757	0.0072	-0.0053
28	122.2	0.0440	0.0074	-0.0064
30	124.2	0.0238	0.0076	-0.0074
32	126.2	0.0127	0.0078	-0.0082
34	128.2	0.0088	0.0080	-0.0089
36	130.2	0.0105	0.0081	-0.0096
38	132.2	0.0166	0.0083	-0.0101
40	134.2	0.0260	0.0086	-0.0106
42	136.2	0.0380	0.0088	-0.0110
44	138.2	0.0520	0.0090	-0.0113
46	140.2	0.0674	0.0092	-0.0116
48	142.2	0.0839	0.0094	-0.0119
50	144.2	0.1012	0.0096	-0.0121
52	146.2	0.1190	0.0098	-0.0123
54	148.2	0.1371	0.0100	-0.0125
56	150.2	0.1555	0.0102	-0.0126
58	152.2	0.1738	0.0105	-0.0127
60	154.2	0.1922	0.0107	-0.0128

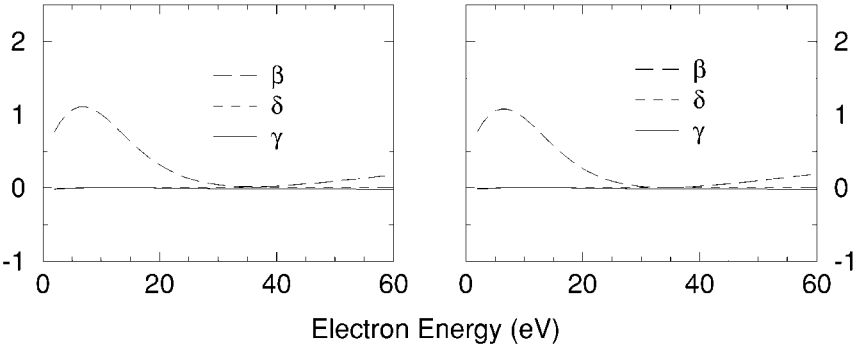

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Kr $4p_{1/2}$ shell $E_b = 14.7$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	16.7	0.9531	0.0026	-0.0035
3	17.7	1.1336	0.0026	-0.0006
4	18.7	1.2711	0.0025	0.0023
5	19.7	1.3801	0.0024	0.0052
6	20.7	1.4690	0.0023	0.0083
7	21.7	1.5428	0.0022	0.0118
8	22.7	1.6049	0.0020	0.0155
9	23.7	1.6575	0.0019	0.0198
10	24.7	1.7023	0.0017	0.0245
11	25.7	1.7404	0.0015	0.0297
12	26.7	1.7727	0.0013	0.0355
13	27.7	1.7998	0.0010	0.0419
14	28.7	1.8221	0.0007	0.0488
15	29.7	1.8399	0.0004	0.0563
16	30.7	1.8537	0.0000	0.0644
17	31.7	1.8634	-0.0005	0.0731
18	32.7	1.8694	-0.0009	0.0822
19	33.7	1.8716	-0.0015	0.0918
20	34.7	1.8702	-0.0020	0.1018
22	36.7	1.8565	-0.0033	0.1226
24	38.7	1.8284	-0.0046	0.1440
26	40.7	1.7858	-0.0060	0.1653
28	42.7	1.7288	-0.0075	0.1854
30	44.7	1.6573	-0.0089	0.2036
32	46.7	1.5717	-0.0102	0.2189
34	48.7	1.4725	-0.0113	0.2305
36	50.7	1.3610	-0.0122	0.2377
38	52.7	1.2388	-0.0126	0.2400
40	54.7	1.1080	-0.0127	0.2372
42	56.7	0.9714	-0.0124	0.2293
44	58.7	0.8320	-0.0116	0.2166
46	60.7	0.6934	-0.0103	0.1997
48	62.7	0.5588	-0.0087	0.1794
50	64.7	0.4316	-0.0067	0.1567
52	66.7	0.3145	-0.0044	0.1326
54	68.7	0.2099	-0.0019	0.1080
56	70.7	0.1193	0.0007	0.0840
58	72.7	0.0434	0.0034	0.0613
60	74.7	-0.0173	0.0060	0.0405

Kr $4p_{3/2}$ shell $E_b = 14.0$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	16.0	0.9472	0.0028	-0.0038
3	17.0	1.1294	0.0027	-0.0009
4	18.0	1.2695	0.0027	0.0020
5	19.0	1.3816	0.0026	0.0050
6	20.0	1.4736	0.0025	0.0082
7	21.0	1.5507	0.0024	0.0118
8	22.0	1.6160	0.0022	0.0157
9	23.0	1.6718	0.0021	0.0201
10	24.0	1.7195	0.0019	0.0250
11	25.0	1.7603	0.0017	0.0306
12	26.0	1.7950	0.0014	0.0367
13	27.0	1.8241	0.0011	0.0434
14	28.0	1.8480	0.0007	0.0508
15	29.0	1.8670	0.0003	0.0588
16	30.0	1.8814	-0.0001	0.0674
17	31.0	1.8912	-0.0006	0.0766
18	32.0	1.8966	-0.0012	0.0863
19	33.0	1.8977	-0.0018	0.0965
20	34.0	1.8943	-0.0025	0.1071
22	36.0	1.8745	-0.0040	0.1292
24	38.0	1.8370	-0.0056	0.1518
26	40.0	1.7816	-0.0074	0.1739
28	42.0	1.7081	-0.0092	0.1944
30	44.0	1.6169	-0.0109	0.2122
32	46.0	1.5086	-0.0124	0.2262
34	48.0	1.3849	-0.0137	0.2356
36	50.0	1.2479	-0.0145	0.2396
38	52.0	1.1007	-0.0149	0.2379
40	54.0	0.9471	-0.0148	0.2303
42	56.0	0.7913	-0.0141	0.2173
44	58.0	0.6379	-0.0129	0.1995
46	60.0	0.4912	-0.0112	0.1779
48	62.0	0.3550	-0.0090	0.1537
50	64.0	0.2327	-0.0065	0.1282
52	66.0	0.1263	-0.0038	0.1024
54	68.0	0.0371	-0.0009	0.0775
56	70.0	-0.0345	0.0020	0.0542
58	72.0	-0.0890	0.0048	0.0333
60	74.0	-0.1276	0.0075	0.0151

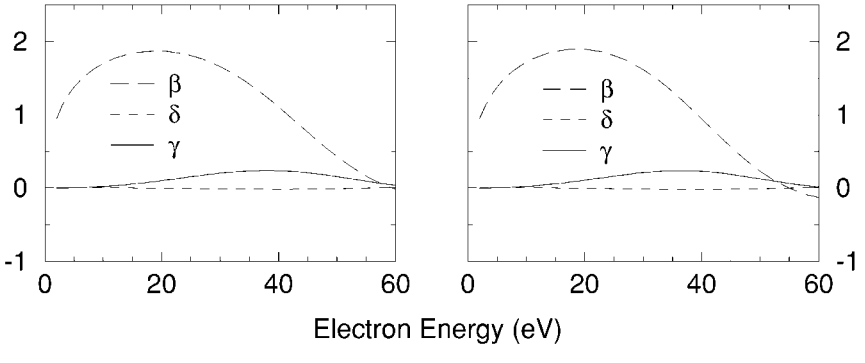

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Xe 4s shell	E_b = 217.7 (eV)			Xe 5s shell	E_b = 23.4 (eV)		
E (eV)	ω (eV)	β	γ	E (eV)	ω (eV)	β	γ
2	219.7	1.9117	0.0076	2	25.4	0.9400	0.0964
3	220.7	1.9119	0.0284	3	26.4	0.6198	0.2601
4	221.7	1.9121	0.0460	4	27.4	0.2150	0.3714
5	222.7	1.9124	0.0609	5	28.4	-0.2488	0.4054
6	223.7	1.9129	0.0738	6	29.4	-0.6835	0.3357
7	224.7	1.9134	0.0851	7	30.4	-0.9476	0.1629
8	225.7	1.9139	0.0952	8	31.4	-0.9400	-0.0620
9	226.7	1.9145	0.1042	9	32.4	-0.6933	-0.2660
10	227.7	1.9151	0.1124	10	33.4	-0.3300	-0.4067
11	228.7	1.9157	0.1200	11	34.4	0.0417	-0.4827
12	229.7	1.9163	0.1270	12	35.4	0.3682	-0.5114
13	230.7	1.9170	0.1336	13	36.4	0.6361	-0.5109
14	231.7	1.9176	0.1398	14	37.4	0.8500	-0.4943
15	232.7	1.9183	0.1457	15	38.4	1.0195	-0.4696
16	233.7	1.9189	0.1512	16	39.4	1.1543	-0.4415
17	234.7	1.9196	0.1565	17	40.4	1.2623	-0.4126
18	235.7	1.9202	0.1616	18	41.4	1.3499	-0.3842
19	236.7	1.9209	0.1665	19	42.4	1.4215	-0.3569
20	237.7	1.9215	0.1712	20	43.4	1.4808	-0.3312
22	239.7	1.9228	0.1801	22	45.4	1.5723	-0.2846
24	241.7	1.9240	0.1884	24	47.4	1.6387	-0.2440
26	243.7	1.9252	0.1963	26	49.4	1.6884	-0.2086
28	245.7	1.9263	0.2037	28	51.4	1.7268	-0.1776
30	247.7	1.9275	0.2108	30	53.4	1.7570	-0.1502
32	249.7	1.9286	0.2175	32	55.4	1.7813	-0.1258
34	251.7	1.9296	0.2239	34	57.4	1.8012	-0.1039
36	253.7	1.9307	0.2300	36	59.4	1.8177	-0.0842
38	255.7	1.9317	0.2359	38	61.4	1.8317	-0.0662
40	257.7	1.9326	0.2415	40	63.4	1.8435	-0.0497
42	259.7	1.9336	0.2468	42	65.4	1.8538	-0.0346
44	261.7	1.9345	0.2520	44	67.4	1.8626	-0.0206
46	263.7	1.9353	0.2570	46	69.4	1.8704	-0.0076
48	265.7	1.9362	0.2617	48	71.4	1.8772	0.0045
50	267.7	1.9370	0.2663	50	73.4	1.8833	0.0158
52	269.7	1.9378	0.2707	52	75.4	1.8888	0.0265
54	271.7	1.9386	0.2750	54	77.4	1.8936	0.0365
56	273.7	1.9393	0.2791	56	79.4	1.8980	0.0460
58	275.7	1.9400	0.2830	58	81.4	1.9020	0.0549
60	277.7	1.9407	0.2868	60	83.4	1.9057	0.0634

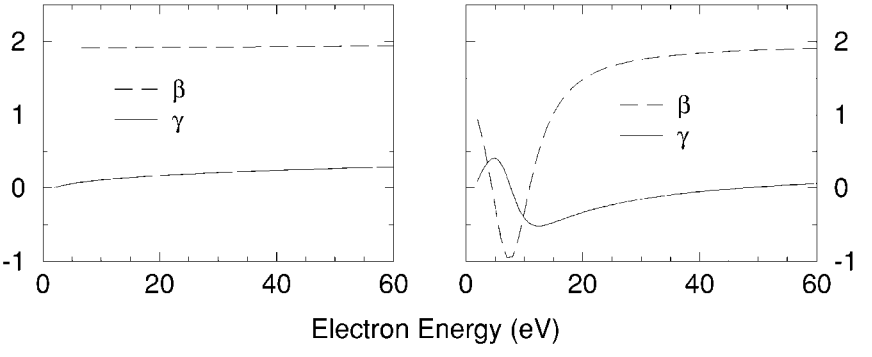

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Xe $4p_{1/2}$ shell $E_b = 163.9$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	165.9	0.2927	0.0234	0.0679
3	166.9	0.3851	0.0230	0.0653
4	167.9	0.4223	0.0257	0.0467
5	168.9	0.4254	0.0315	0.0115
6	169.9	0.4076	0.0408	-0.0417
7	170.9	0.3771	0.0540	-0.1149
8	171.9	0.3391	0.0714	-0.2101
9	172.9	0.2969	0.0934	-0.3280
10	173.9	0.2527	0.1198	-0.4665
11	174.9	0.2079	0.1492	-0.6180
12	175.9	0.1635	0.1787	-0.7663
13	176.9	0.1202	0.2035	-0.8858
14	177.9	0.0785	0.2178	-0.9465
15	178.9	0.0385	0.2167	-0.9262
16	179.9	0.0005	0.1996	-0.8237
17	180.9	-0.0355	0.1700	-0.6604
18	181.9	-0.0696	0.1339	-0.4682
19	182.9	-0.1018	0.0968	-0.2760
20	183.9	-0.1320	0.0624	-0.1017
22	185.9	-0.1868	0.0072	0.1683
24	187.9	-0.2342	-0.0300	0.3402
26	189.9	-0.2744	-0.0537	0.4405
28	191.9	-0.3080	-0.0681	0.4926
30	193.9	-0.3353	-0.0761	0.5129
32	195.9	-0.3568	-0.0798	0.5120
34	197.9	-0.3730	-0.0804	0.4969
36	199.9	-0.3844	-0.0788	0.4723
38	201.9	-0.3912	-0.0758	0.4415
40	203.9	-0.3940	-0.0716	0.4068
42	205.9	-0.3932	-0.0667	0.3699
44	207.9	-0.3890	-0.0613	0.3320
46	209.9	-0.3820	-0.0556	0.2942
48	211.9	-0.3723	-0.0497	0.2571
50	213.9	-0.3603	-0.0438	0.2212
52	215.9	-0.3462	-0.0378	0.1869
54	217.9	-0.3303	-0.0320	0.1544
56	219.9	-0.3128	-0.0263	0.1240
58	221.9	-0.2940	-0.0209	0.0957
60	223.9	-0.2741	-0.0156	0.0696

Xe $4p_{3/2}$ shell $E_b = 156.5$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	158.5	-0.0295	0.0260	0.0605
3	159.5	-0.0710	0.0272	0.0523
4	160.5	-0.1190	0.0310	0.0320
5	161.5	-0.1685	0.0376	-0.0006
6	162.5	-0.2170	0.0473	-0.0467
7	163.5	-0.2629	0.0606	-0.1074
8	164.5	-0.3057	0.0778	-0.1839
9	165.5	-0.3451	0.0991	-0.2762
10	166.5	-0.3810	0.1243	-0.3820
11	167.5	-0.4135	0.1521	-0.4950
12	168.5	-0.4426	0.1800	-0.6027
13	169.5	-0.4686	0.2034	-0.6860
14	170.5	-0.4917	0.2172	-0.7236
15	171.5	-0.5122	0.2170	-0.7005
16	172.5	-0.5303	0.2019	-0.6172
17	173.5	-0.5463	0.1751	-0.4906
18	174.5	-0.5603	0.1421	-0.3449
19	175.5	-0.5723	0.1080	-0.2013
20	176.5	-0.5825	0.0761	-0.0729
22	178.5	-0.5977	0.0251	0.1208
24	180.5	-0.6065	-0.0093	0.2385
26	182.5	-0.6096	-0.0310	0.3020
28	184.5	-0.6077	-0.0441	0.3301
30	186.5	-0.6014	-0.0513	0.3356
32	188.5	-0.5914	-0.0545	0.3266
34	190.5	-0.5781	-0.0551	0.3085
36	192.5	-0.5620	-0.0537	0.2847
38	194.5	-0.5435	-0.0511	0.2576
40	196.5	-0.5230	-0.0476	0.2288
42	198.5	-0.5008	-0.0435	0.1994
44	200.5	-0.4771	-0.0390	0.1702
46	202.5	-0.4522	-0.0343	0.1419
48	204.5	-0.4264	-0.0294	0.1148
50	206.5	-0.3999	-0.0246	0.0892
52	208.5	-0.3727	-0.0198	0.0653
54	210.5	-0.3451	-0.0151	0.0432
56	212.5	-0.3172	-0.0106	0.0228
58	214.5	-0.2891	-0.0062	0.0044
60	216.5	-0.2609	-0.0021	-0.0123

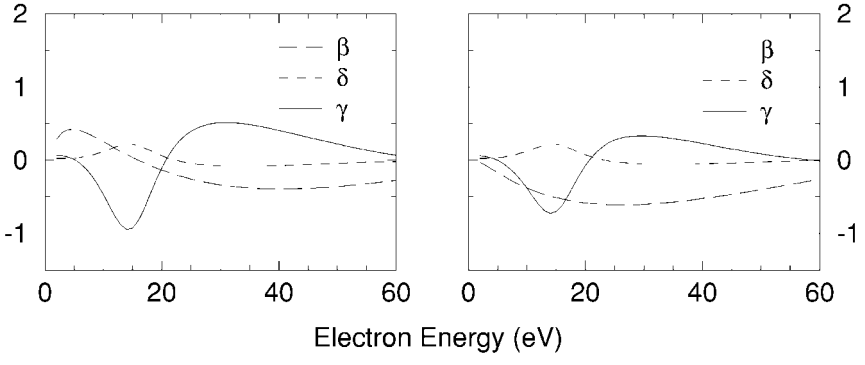

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Xe $4d_{3/2}$ shell $E_b = 69.5$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	71.5	1.6591	-0.0005	-0.0078
3	72.5	1.6736	0.0012	-0.0064
4	73.5	1.5399	0.0021	-0.0058
5	74.5	1.3367	0.0025	-0.0058
6	75.5	1.1208	0.0027	-0.0060
7	76.5	0.9244	0.0026	-0.0063
8	77.5	0.7608	0.0025	-0.0066
9	78.5	0.6325	0.0024	-0.0068
10	79.5	0.5365	0.0022	-0.0070
11	80.5	0.4679	0.0020	-0.0071
12	81.5	0.4219	0.0018	-0.0071
13	82.5	0.3939	0.0016	-0.0072
14	83.5	0.3801	0.0014	-0.0072
15	84.5	0.3776	0.0012	-0.0073
16	85.5	0.3840	0.0010	-0.0073
17	86.5	0.3972	0.0007	-0.0074
18	87.5	0.4159	0.0005	-0.0076
19	88.5	0.4389	0.0002	-0.0078
20	89.5	0.4652	0.0000	-0.0081
22	91.5	0.5253	-0.0006	-0.0088
24	93.5	0.5919	-0.0011	-0.0100
26	95.5	0.6627	-0.0017	-0.0115
28	97.5	0.7358	-0.0023	-0.0136
30	99.5	0.8104	-0.0030	-0.0161
32	101.5	0.8857	-0.0036	-0.0193
34	103.5	0.9613	-0.0042	-0.0232
36	105.5	1.0370	-0.0047	-0.0278
38	107.5	1.1126	-0.0052	-0.0333
40	109.5	1.1878	-0.0057	-0.0397
42	111.5	1.2626	-0.0061	-0.0471
44	113.5	1.3367	-0.0063	-0.0556
46	115.5	1.4100	-0.0064	-0.0654
48	117.5	1.4820	-0.0064	-0.0765
50	119.5	1.5523	-0.0061	-0.0890
52	121.5	1.6204	-0.0056	-0.1031
54	123.5	1.6855	-0.0048	-0.1189
56	125.5	1.7466	-0.0037	-0.1365
58	127.5	1.8024	-0.0021	-0.1559
60	129.5	1.8513	-0.0001	-0.1773

Xe $4d_{5/2}$ shell $E_b = 67.6$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	69.6	1.6150	0.0002	-0.0063
3	70.6	1.5878	0.0018	-0.0054
4	71.6	1.4284	0.0026	-0.0052
5	72.6	1.2149	0.0029	-0.0056
6	73.6	1.0002	0.0030	-0.0061
7	74.6	0.8125	0.0029	-0.0065
8	75.6	0.6617	0.0028	-0.0069
9	76.6	0.5477	0.0026	-0.0072
10	77.6	0.4663	0.0024	-0.0073
11	78.6	0.4117	0.0022	-0.0074
12	79.6	0.3787	0.0020	-0.0074
13	80.6	0.3626	0.0018	-0.0075
14	81.6	0.3596	0.0016	-0.0075
15	82.6	0.3668	0.0013	-0.0075
16	83.6	0.3817	0.0011	-0.0075
17	84.6	0.4027	0.0008	-0.0076
18	85.6	0.4284	0.0006	-0.0077
19	86.6	0.4575	0.0003	-0.0079
20	87.6	0.4894	0.0001	-0.0082
22	89.6	0.5589	-0.0005	-0.0090
24	91.6	0.6333	-0.0011	-0.0102
26	93.6	0.7103	-0.0017	-0.0119
28	95.6	0.7886	-0.0023	-0.0140
30	97.6	0.8674	-0.0029	-0.0168
32	99.6	0.9463	-0.0035	-0.0201
34	101.6	1.0249	-0.0041	-0.0242
36	103.6	1.1030	-0.0047	-0.0291
38	105.6	1.1806	-0.0052	-0.0349
40	107.6	1.2575	-0.0057	-0.0416
42	109.6	1.3335	-0.0060	-0.0494
44	111.6	1.4086	-0.0063	-0.0583
46	113.6	1.4824	-0.0064	-0.0686
48	115.6	1.5545	-0.0063	-0.0802
50	117.6	1.6245	-0.0060	-0.0933
52	119.6	1.6916	-0.0055	-0.1080
54	121.6	1.7549	-0.0047	-0.1244
56	123.6	1.8133	-0.0034	-0.1426
58	125.6	1.8651	-0.0018	-0.1627
60	127.6	1.9083	0.0004	-0.1847

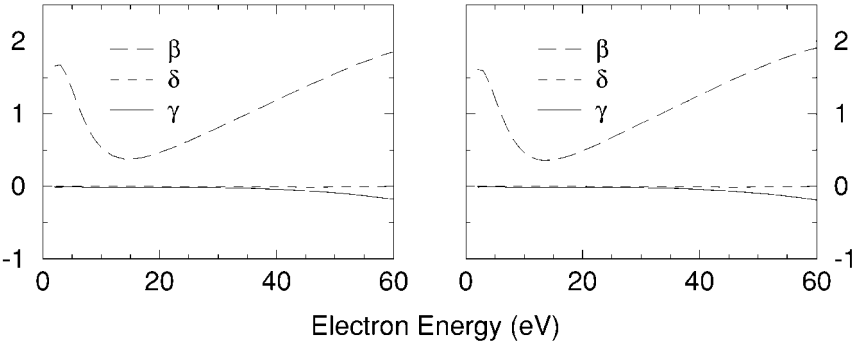

TABLE II. Non-dipole Angular-Distribution Parameters for Photoelectrons from the Outer Subshells of Kr and Xe (2–60 eV)

See page 162 for Explanation of Tables

Xe $5p_{1/2}$ shell $E_b = 13.4$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	15.4	1.2541	0.0020	0.0000
3	16.4	1.4123	0.0021	0.0047
4	17.4	1.5265	0.0022	0.0103
5	18.4	1.6127	0.0023	0.0169
6	19.4	1.6796	0.0023	0.0249
7	20.4	1.7321	0.0024	0.0342
8	21.4	1.7735	0.0024	0.0448
9	22.4	1.8062	0.0025	0.0563
10	23.4	1.8316	0.0025	0.0680
11	24.4	1.8509	0.0024	0.0786
12	25.4	1.8649	0.0023	0.0862
13	26.4	1.8743	0.0021	0.0886
14	27.4	1.8795	0.0018	0.0843
15	28.4	1.8810	0.0014	0.0736
16	29.4	1.8792	0.0008	0.0588
17	30.4	1.8742	0.0000	0.0434
18	31.4	1.8663	-0.0008	0.0306
19	32.4	1.8557	-0.0018	0.0224
20	33.4	1.8426	-0.0027	0.0191
22	35.4	1.8093	-0.0048	0.0250
24	37.4	1.7675	-0.0068	0.0426
26	39.4	1.7181	-0.0090	0.0666
28	41.4	1.6618	-0.0111	0.0941
30	43.4	1.5994	-0.0133	0.1228
32	45.4	1.5316	-0.0155	0.1515
34	47.4	1.4590	-0.0175	0.1792
36	49.4	1.3824	-0.0195	0.2051
38	51.4	1.3025	-0.0212	0.2288
40	53.4	1.2200	-0.0228	0.2497
42	55.4	1.1358	-0.0242	0.2676
44	57.4	1.0505	-0.0253	0.2821
46	59.4	0.9650	-0.0261	0.2932
48	61.4	0.8799	-0.0267	0.3007
50	63.4	0.7960	-0.0269	0.3048
52	65.4	0.7139	-0.0269	0.3056
54	67.4	0.6344	-0.0266	0.3032
56	69.4	0.5579	-0.0260	0.2978
58	71.4	0.4850	-0.0252	0.2898
60	73.4	0.4160	-0.0241	0.2793

Xe $5p_{3/2}$ shell $E_b = 12.1$ (eV)

E (eV)	ω (eV)	β	δ	γ
2	14.1	1.2445	0.0024	-0.0007
3	15.1	1.4129	0.0025	0.0042
4	16.1	1.5371	0.0026	0.0102
5	17.1	1.6328	0.0027	0.0173
6	18.1	1.7083	0.0027	0.0259
7	19.1	1.7684	0.0027	0.0359
8	20.1	1.8164	0.0026	0.0471
9	21.1	1.8544	0.0024	0.0592
10	22.1	1.8838	0.0022	0.0712
11	23.1	1.9058	0.0019	0.0817
12	24.1	1.9212	0.0016	0.0887
13	25.1	1.9306	0.0013	0.0898
14	26.1	1.9345	0.0009	0.0837
15	27.1	1.9333	0.0006	0.0709
16	28.1	1.9273	0.0001	0.0542
17	29.1	1.9168	-0.0004	0.0375
18	30.1	1.9021	-0.0010	0.0244
19	31.1	1.8834	-0.0018	0.0167
20	32.1	1.8608	-0.0027	0.0148
22	34.1	1.8050	-0.0049	0.0254
24	36.1	1.7363	-0.0075	0.0489
26	38.1	1.6561	-0.0103	0.0791
28	40.1	1.5660	-0.0133	0.1120
30	42.1	1.4676	-0.0163	0.1451
32	44.1	1.3627	-0.0193	0.1768
34	46.1	1.2528	-0.0221	0.2058
36	48.1	1.1398	-0.0247	0.2312
38	50.1	1.0255	-0.0270	0.2524
40	52.1	0.9115	-0.0289	0.2691
42	54.1	0.7994	-0.0304	0.2811
44	56.1	0.6907	-0.0315	0.2883
46	58.1	0.5865	-0.0322	0.2909
48	60.1	0.4881	-0.0324	0.2892
50	62.1	0.3962	-0.0321	0.2836
52	64.1	0.3114	-0.0315	0.2746
54	66.1	0.2342	-0.0305	0.2626
56	68.1	0.1647	-0.0292	0.2482
58	70.1	0.1031	-0.0276	0.2319
60	72.1	0.0492	-0.0258	0.2142