Erratum: Multiphoton processes in a hydrogen atom [Phys. Rev. A 4, 1896 (1971)]

Y. Gontier and M. Trahin

Except for two-photon transition between atomic bound S states, Eq. (11b) must be replaced by Eq. (3). The transition matrix element is computed by choosing the unit polarization vector $\vec{\epsilon}$ along the x axis and the propagation vector $\vec{k}$ of the incoming photon in the z direction. The angular contribution to $\mathfrak{M}^{(N)}(E_s, E_p)$ depends on the angular coordinates (ψ, η) specifying the direction of the emitted photon; it can be written

$$G_\nu(l_1, m_1; \ldots; l_\nu, m_\nu; \ldots; L, M)$$
$$= \tfrac{1}{2}[Q_+(l_1, l)\delta(m_1, m+1) + Q_-(l_1, l)\delta(m_1, m-1)] \cdots$$
$$\times[\tfrac{1}{2}(1 - i\cos\psi)e^{-i\eta}Q_+(l_{\nu+1}, l_\nu)\delta(m_{\nu+1}, m_\nu + 1) - \tfrac{1}{2}(1 + i\cos\psi)e^{i\eta}Q_-(l_{\nu+1}, l_\nu)\delta(m_{\nu+1}, m_\nu - 1)$$
$$+ i\sin\psi\, Q_0(l_{\nu+1}, l_\nu)\delta(m_{\nu+1}, m_\nu)] \cdots \tfrac{1}{2}[Q_+(L, l_{N-1})\delta(M, m_{N-1} + 1) + Q_-(L, l_{N-1})\delta(M, m_{N-1} - 1)]$$

and must be used instead of Eq. (17) which is only valid for $\nu = 0$. To compare with our previous results, some data pertaining to the $1S \rightarrow 1S$ and $1S \rightarrow 2S$ transitions are shown here in Figs. 1 and 2. The differences between our new result and the preceding one can be understood in noting that our former procedure eliminates some channels and only includes transitions with $\Delta m = 0$. Now, the values of the I_S threshold defined in the conclusions of the paper are modified: At 6943 Å for $1S \rightarrow 2P$ transitions $I_S = 2 \times 10^8$ W/cm^2; at 5300

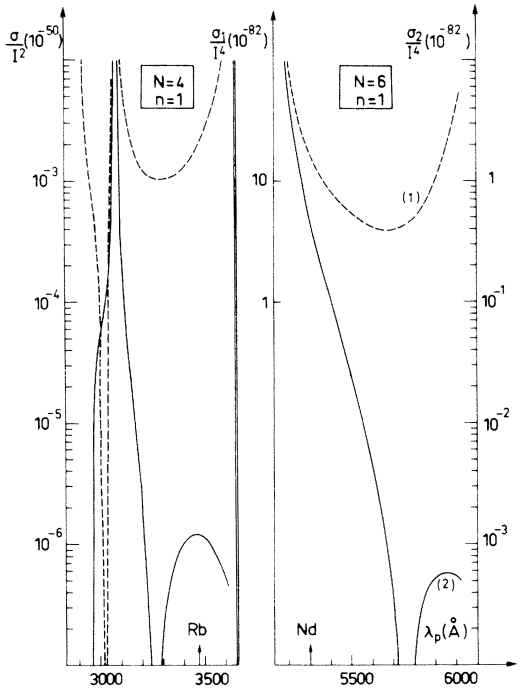

FIG. 1. Transition rate σ/I^{N-2} for $1S \rightarrow 1S$ (broken lines) and $1S \rightarrow 2S$ transition (solid lines) with $N = 4$ and 6.

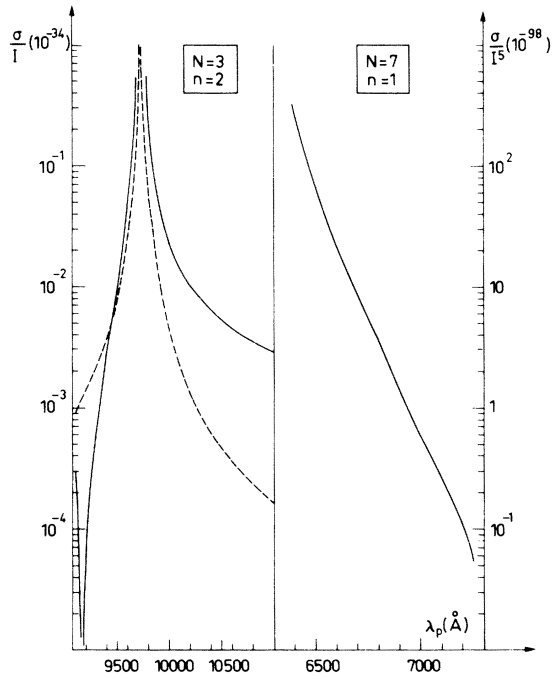

FIG. 2. Transition rate σ/I^{N-2} for $2S \rightarrow 2P$ (solid line) and $2S \rightarrow 3P$ transition (broken line) with $N = 3$. The curve on the right-hand side gives results for the $1S \rightarrow 2P$ transition with $N = 7$.

Å for $1S-1S$ transitions $I_S = 3.4\times10^6$ W/cm^2; at 3471 Å for $1S-1S$ and $1S-2S$ transitions, $I_S = 3.0\times10^7$ W/cm^2 and 1.7×10^4 W/cm^2, respectively.

For the usual laser intensities, the ionization process remains the dominant one.

We are indebted to Dr. A. Maquet for bringing this error to our attention. [See also Y. Heno, A. Maquet, and R. Schwarz, this issue, Phys. Rev. A 14, 1936 (1976).]

Erratum: Cross section profiles of resonances in the photoionization continuum of krypton and xenon (600–400 Å) [Phys. Rev. A 4, 2263 (1971)]

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Equation (4) in this paper is incorrect. It should read

$$\sigma(E) = C(E) + \frac{2\sigma_a q(\Gamma/2)(E-E_r) + \sigma_a(q^2-1)(\Gamma/2)^2}{(E-E_r)^2 + (\Gamma/2)^2}. \tag{4}$$

Unfortunately the incorrect form of the cross section was inadvertently used to transform the parameters from the Fano representation to the Shore representation, consequently, some of the parameter values listed in Tables I and II are incorrect. The corrected tables appear below. The change in some of the a_i's will slightly effect the cross-section profiles of the resonances shown in Figs. 1 and 2.

The author is indebted to P.C. Kemeny and A. Starace for bringing these inconsistencies to his attention.

TABLE I. Parameters for resonances in krypton. The quantities a, b, C, Γ, and ΔE define the resonance profile according to Eq. (2), while the profile index q and the correlation index ρ^2 are evaluated when the resonance was treated as a single noninteracting resonance. The bracket in the number-of-runs column encloses the number of resonances included in the group analyzed.

Code [a]	λ (Å)	E (eV)	ΔE (meV)	b (cm^{-1})	a (cm^{-1})	C (cm^{-1})	Γ [c] (meV)	q	ρ^2	No. of runs
1	501.23	24.735	···	−260 ± 80	−115 ± 15	815 ± 70	4.0 ± 0.5	−0.22 ± 0.03	0.34 ± 0.03	4
3			67.0 ± 0.6 [b]	−450 ± 55	280 ± 60		19.04 ± 0.54			}
4			38.9 ± 0.03	−500 ± 45	0 ± 40	750 ± 70	7.50 ± 0.70			} 7
5	496.07	24.992	0.0	−430 ± 45	−300 ± 70		22.8 ± 0.8			}
6	492.52	25.173	···	−295 ± 75	−60 ± 24	770 ± 90	3.9 ± 0.3	−0.10 ± 0.06	0.39 ± 0.02	3
9	472.26	26.253	0.0	−60 ± 120	350 ± 150		1.58 ± 0.28			}
10			44.4 ± 0.4	−220 ± 100	320 ± 20	680 ± 70	7.36 ± 0.80			} 8
11			55.3 ± 2.5	−515 ± 65	−150 ± 85		13.2 ± 0.5			}
14	462.71	26.794	···	−385 ± 80	90 ± 30	635 ± 60	7.8 ± 0.6	0.11 ± 0.03	0.62 ± 0.02	5
15	461.83	26.864	···	−132 ± 80	−110 ± 40	635 ± 60	3.5 ± 0.8	−0.38 ± 0.06	0.24 ± 0.03	3
18		27.036	42.0 ± 1.5	−55 ± 30	130 ± 15	650 ± 50	6.8 ± 0.8			}
19	457.86	27.078	0.0	−105 ± 40	−370 ± 25		7.18 ± 0.32			} 7

[a] The code number and the wavelength are taken from Ref. 9.

[b] The quoted error for the parameters of these resonances corresponds to the standard deviation.

[c] In addition to the statistical quoted, the parameters a, b, Γ, q, and ρ^2 are subject to a systematic error due to the uncertainty in the width of the slit function (2.0 ± 0.2 meV). This systematic error amounts to approximately 10% of the parameter value for resonances whose width is equal to the slit function width and decreases proportionately as the slit width to resonance width ratio decreases.