Erratum

Relativistic calculation of Stokes' parameters for intermediate energy electron impact excitation of cesium atoms

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We have found a computational error in our RDW computer algorithm which has affected the results previously published. We therefore show the revised version of our results here.

Figures 1–3 show the various differential Stokes' parameters at an incident electron energy of 20 eV. The behaviour of these parameters differs substantially from the published results except for small scattering angles and near 180 degrees.

In Fig. 4 we show the integrated Stokes' parameter η_3^y for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$. This parameter is now seen to lie in between the experimental data of Eschen et al. [6] and Chen and Gallagher [7]. In Fig. 5 we show the integrated parameters η_2^y/P_y and η_1^y/P_y for the same transition. η_2^y/P_y is roughly the same shape as before but has decreased in value by approximately a factor of 10. Although our results are of the same order of magnitude as the experimental values of Eschen et al. [6], they differ in sign. Our results for η_1^y/P_y are now extremely

Fig. 1. Differential Stokes' parameters for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$ in cesium after impact excitation by unpolarized electrons with an incident energy of 20 eV. —, η_3^y ; - - -, η_1^y ; - · - · -, η_2^y

Fig. 2. As in Fig. 1 for η_2^z/P_{atom} where P_{atom} is the spin polarization of the atom in its initial state

Fig. 3. Differential Stokes' parameters for the transition $(6p) \ ^2P_{1/2} \rightarrow (6s) \ ^2S_{1/2}$ in cesium after impact excitation by unpolarized electrons with an incident energy of 20 eV. —, η_2^y ; - - -, η_2^z/P_{atom}

Fig. 4. Integrated Stokes' parameter η_3^y , multiplied by a factor of 100, for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$ in cesium after impact excitation by electrons polarized in the y -direction. ●, Present data; ○, experimental results of Eschen et al. [6]; ×, experimental results of Chen and Gallagher [7]

Fig. 5. Integrated Stokes' parameters, multiplied by a factor of 100, for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$ in cesium after impact excitation by electrons polarized in the y -direction. ●, Present data for η_2^y/P_y ; ○, experimental results of Eschen et al. [6] for η_2^y/P_y ; ■, present data for η_1^y/P_y . Here P_y is the polarization of the incident electrons

Fig. 6. Integrated Stokes' parameters, multiplied by a factor of 100, in cesium after impact excitation by polarized electrons. ●, η_2^z/P_z for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$; ■, η_2^y/P_y for the transition $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$; ◇, η_2^z/P_z for the transition $(6p) \ ^2P_{1/2} \rightarrow (6s) \ ^2S_{1/2}$. The electrons are polarized in the same direction as the orientation of the photon detector

close to zero in value. In Fig. 6 we show η_2^z/P_z for the $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$ transition as well as the two circular integrated Stokes' parameters for the $(6p) \ ^2P_{1/2} \rightarrow (6s) \ ^2S_{1/2}$ transition. The η_2^y/P_y parameter for the $(6p) \ ^2P_{3/2} \rightarrow (6s) \ ^2S_{1/2}$ transition has not changed appreciably. For the $(6p) \ ^2P_{1/2} \rightarrow (6s) \ ^2S_{1/2}$ transition, η_2^z/P_z has decreased by approximately 1/2 while η_2^y/P_y has changed in both magnitude and sign.

We also update our reference list here:

3. Zeman, V., McEachran, R.P., Stauffer, A.D.: J. Phys. B27, 3175 (1994)