01 Jun 2015

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Recommended Citation

S. Amami et al., "Erratum: Theoretical and Experimental (e,2e) Study of Electron-Impact Ionization of Laser-Aligned Mg Atoms [Physical Review A 90, 062707 (2014)]," *Physical Review A - Atomic, Molecular, and Optical Physics*, vol. 91, no. 6, American Physical Society (APS), Jun 2015.
The definitive version is available at https://doi.org/10.1103/PhysRevA.91.069906

Erratum: Theoretical and experimental $(e,2e)$ study of electron-impact ionization of laser-aligned Mg atoms [Phys. Rev. A 90, 062707 (2014)]

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(Received 2 June 2015; published 25 June 2015)

DOI: 10.1103/PhysRevA.91.069906 PACS number(s): 34.80.Dp, 99.10.Cd

We have recently reported a theoretical and experimental study of electron-impact ionization of laser-aligned magnesium. Results were presented for both ionization of the ground state, as well as for laser-aligned atoms in the $3p$ state. For ionization from the $3p$ state, theoretical results were presented using the distorted wave Born (DWBA) and three-body distorted wave (3DW) approximations. Unfortunately, after publication we learned that the theoretical results were incorrect due to one of the arrays in the computer code dimensioned too small. The figures affected by this error are Figs. 3–5 in the original paper. The present Figs. 3–5 show the corrected results. The DWBA calculation changed the most. In the original paper, the DWBA had unphysical side lobes for the $3p$ state aligned in the scattering plane (Figs. 4 and 5). These side lobes are either reduced or eliminated in the corrected DWBA. However, the main peak magnitudes are now much larger. There is a much smaller correction to the 3DW results. The good news is that overall the 3DW is now in even better agreement with experiment. The fact that both theories predict a zero cross section for alignment of the $3p$ state perpendicular to the scattering plane (the y axis) did not change.

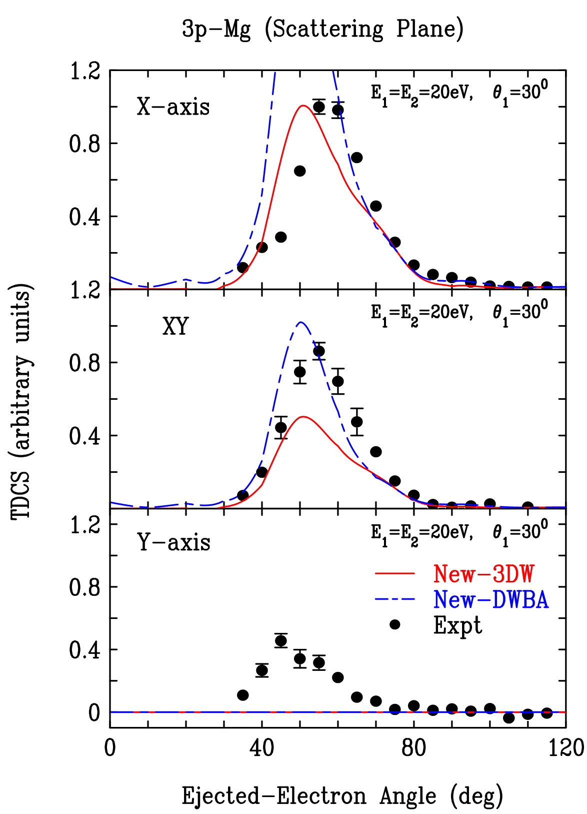

FIG. 3. (Color online) Experimental and theoretical TDCS for electron-impact ionization of the laser-aligned $3p$ state of Mg. The projectile scattering angle θ_1 is 30° and both outgoing electrons have the same energy ($E_1 = E_2 = 20$ eV). The three panels are for laser alignment parallel to the x axis (i.e., in the scattering plane orthogonal to the incident electron beam direction), laser alignment at 45° between the x and y axes, and laser alignment parallel to the y axis (i.e., perpendicular to the scattering plane), respectively. In the bottom panel, the theoretical results are all exactly zero. The theoretical calculations are as follows: new 3DW solid (red); new DWBA dashed (blue).

1050-2947/2015/91(6)/069906(2)

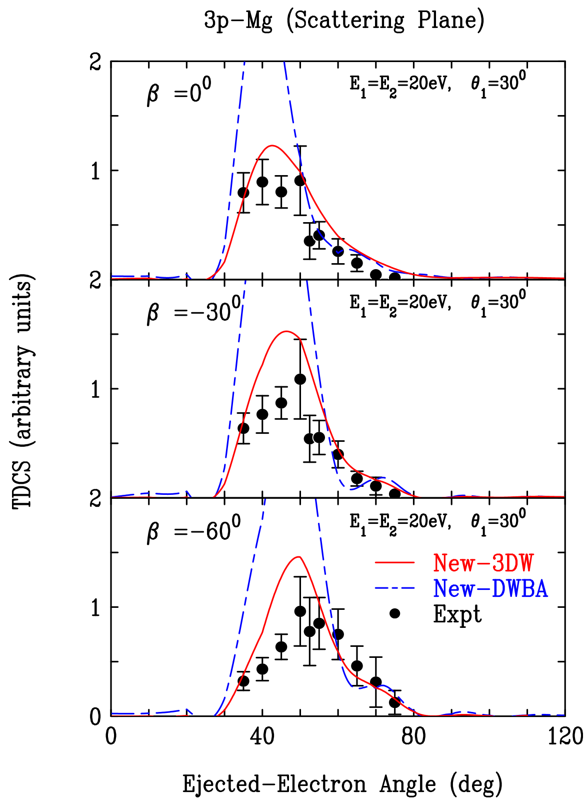

FIG. 4. (Color online) Experimental and theoretical TDCS for electron-impact ionization of the laser-aligned $3p$ state of Mg. The projectile scattering angle is 30° and both outgoing electrons have the same energy ($E_1 = E_2 = 20$ eV). The three panels are for laser alignment in the scattering plane by different orientation angles "beta" relative to the incident electron beam direction. The theoretical calculations are as follows: new 3DW solid (red); and new DWBA dashed (blue).

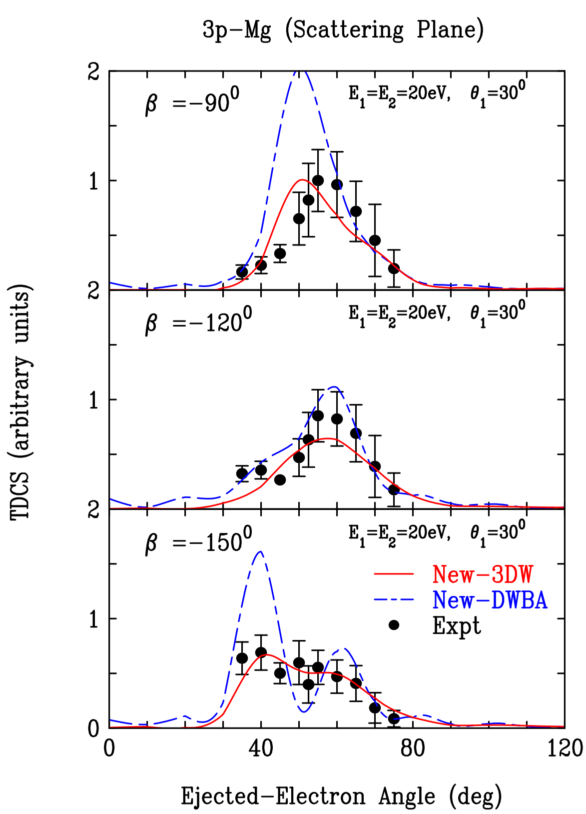

FIG. 5. (Color online) Same as Fig. 4 except for larger beta angles.