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Polarization Effects in the Ionization Cross Section for Collisions of $Ne^{**}\{(2p)^5(3p);J=3\}$ with Ar: A Sensitive Probe for "Locking" Phenomena [Phys. Rev. Lett. 62, 2369 (1989)]

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In our Letter we presented polarization-dependent cross-section results for $Ne^{**}\{(2p)^5(3p);J=3\}$-Ar in a broad energy range. The energy dependence of the polarization effect is a sensitive probe for "locking phenomena." A simple locking criterion is introduced, which has a wide range of possible applications. A detailed discussion of this locking model is presented by Driessen *et al.*[1]

For the ionization width $\Gamma(R)$ we introduced a two-state basis, by taking into account only one electron, going into the $Ne(2p)^{-1}$ hole. This simple model is sufficient to describe the polarization effect, but cannot describe final-state, fine-structure branching ratios, as discussed previously by Bussert and co-workers.[2] For this detailed information a more extensive model is required,[2] as proposed by Morgner.[3] In this latter model the number of free parameters is considerably larger, but was restricted to five significant transition amplitudes by Bussert and co-workers[2] in a least-squares analysis of their $Ne^{**}(2p_x+Ar)$ total ionization cross sections and Ar^+ fine-structure branching ratios, measured for eight $Ne^{**}(2p_x,\ x=2,4-10)$ states. We have performed a theoretical analysis using the Feshbach-projection formalism to calculate the ionization amplitudes. Basically this analysis contains the same parameters as the model of Bussert and co-workers.[2] We find a set of seven significant matrix elements that are in slight but distinct disagreement with Bussert's empirical values. A detailed comparison of these two extended models is described by Driessen *et al.*[4]

Lastly, Eq. (4) should read

$$\Gamma^{\Omega}=g_{\pi}^{\Omega}\Gamma_{\pi}+(1-g_{\pi}^{\Omega})\Gamma_{\sigma}.$$

[1] J. P. J. Driessen, F. J. M. van de Weijer, M. J. Zonneveld, L. M. T. Somers, M. F. M. Janssens, H. C. W. Beijerinck, and B. J. Verhaar (to be published).

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