COULOMB-BORN-OPPENHEIMER APPROXIMATION IN Ps-Atom SCATTERING

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A direct approach of evaluating the nine-dimensional exchange amplitude for ionization of positronium (Ps) in Ps-Atom scattering is developed using a Coulomb-Born-Oppenheimer approximation (CBOA). The present methodology is extremely useful to evaluate ionization cross section for different target systems and for different types of ionization processes. It is applied to calculate the Ps-ionization cross section and to estimate the effect of exchange in Ps-H [1] and Ps-He [2,3] systems. A continuum Coulomb wavefunction is used for the ionized electron to consider the effect of continuum instead of using a few selected discrete pseudostates as in coupled-channel R-matrix theory [4,5]. The results are compared with available experimental data of Ps-ionization in Ps-He [6] system.

References

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