



## K-shell and L-shell (e,3e) double ionization of beryllium by fast electron impact

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Résumé en anglais We report fully differential cross sections for simultaneous double ionization of atomic beryllium by fast electron impact. We analyze separately the two ionization channels that leave the dication in either the  $2s^2$  autoionizing excited state or its  $1s^2$  bound ground state. For the double continuum, owing to the two slow emitted electrons, we employ the three-pairwise-Coulomb-interaction model (3C) along with the first Born approximation. Aiming to probe the hitherto largely unexplored role of the electron correlation in (e,3e), we determine and check fully correlated, compact analytical wave functions, satisfying all two-particle Kato cusp conditions for the four-electron Be initial state and the two-electron Be<sup>2+</sup> final states, as well as other, much or little or noncorrelated, functions, issuing from either analytic global optimization or Hartree-Fock theory. We point out similarities or contrasts with trends observed in the double photoionization, allowing for parallels between (e,3e) and ( $\gamma$ ,2e). Various numerical examples serve to navigate possible future experiments in the nonrelativistic regime of the ionization problem.

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