Abstract Submitted
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B-Spline Breit-Pauli R-matrix calculations for electron collisions with Krypton and Xenon.[1] KLAUS BARTSCHAT, OLEG ZATSARINNY, Drake University — We have extended our previous work on electron collisions with Ne [1] and Ar [2] to the heavier noble gas targets Kr and Xe. In our B-Spline R-matrix method [3,4], relativistic effects are accounted for through the most important terms of the Breit-Pauli hamiltonian in the inner region of the R-matrix box. Several sets of non-orthogonal valence orbitals were employed to account for the strong term dependence in the one-electron orbitals. Using non-orthogonal basis sets avoids the need for pseudo-orbitals to improve upon the target description and virtually eliminates pseudo-resonance problems. The agreement between our predictions and experiment [5] is much better than obtained in previous calculations based on the standard R-matrix approach with strictly orthogonal orbitals, particularly in details such as resonance positions and widths. Consequently, the new results are expected to represent a significant improvement of the current database for electron collisions with heavy noble gases.

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Klaus Bartschat
Drake University

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