

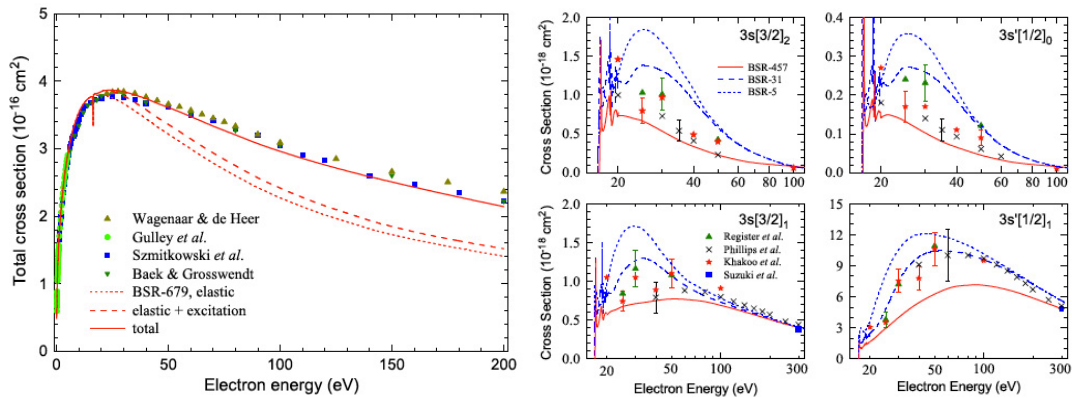
# B-Spline R-Matrix with Pseudo-States Treatment of Electron Collisions with Neon

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**Abstract.** Calculated cross sections for elastic scattering, excitation, and ionization of Ne atoms by electron impact are presented and compared with experiment.

We report large-scale B-spline R-matrix with pseudo-states calculations for electron scattering from Ne atoms. Combining a highly sophisticated structure description with a convergent multi-channel collision model, including coupling to the ionization continuum, we provide accurate and effectively complete datasets for many applications.



The figures show results for the angle-integrated total (elastic plus excitation plus ionization) and the individual cross sections for excitation of the four states in the  $2p^5 3s$  manifold over a wide range of incident energies. For the latter case, note the importance of coupling to the ionization continuum in the 457-state model compared to the 31-state and 5-state models, which only contain discrete states in the close-coupling expansion. While we obtain excellent agreement with experiment for the total cross section, the scatter in the state-selected experimental data indicates the difficulty of the measurements. Based on detailed convergence studies and other observables, such as angle-differential cross sections and light polarizations (to be shown at the conference), we believe that the 457-state results are the most reliable and should be used in modeling applications. Our predictions are available on the LXCAT database.

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