

Abstract Submitted
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Applications of the hybrid theory to the scattering of electrons from He^+ and Li^{++} and resonances in these systems A.K. BHATIA, NASA/Goddard Space Flight Center — The Hybrid theory of electron-hydrogen elastic scattering¹ is applied to the S-wave scattering of electrons from He^+ and Li^{++} . In this method, both short-range and long-range correlations are included in the Schrodinger equation at the same time. Phase shifts obtained in this calculation have rigorous lower bounds to the exact phase shifts and they are compared with those obtained using the Feshbach projection operator formalism², the close-coupling approach³, and Harris-Nesbet method⁴. The agreement among all these calculations is very good. These systems have doubly-excited or Feshbach resonances embedded in the continuum. The resonance parameters for the lowest ^1S resonances in He and Li^+ are calculated and they are compared with the results obtained using the Feshbach projection operator formalism⁵ and⁶. It is concluded that accurate resonance parameters can be obtained by the present method, which has the advantage of including corrections due to neighboring resonances and the continuum in which these resonances are embedded.

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