

TOWARDS A DEFINITIVE TREATMENT OF INELASTIC ION-ATOM COLLISIONS¹

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Utilizing a lattice representation of the wavefunction and operators, we have solved the time-dependent Schrödinger equation over a wide range of collision energies and impact parameters to study excitation to low-lying states in collisions of protons with atomic hydrogen. The investigation represents a step towards precise knowledge of the dynamical quantities characterizing a fundamental atomic collision system based on an approach applicable over the whole impact energy range in which the Schrödinger equation is valid. Thus, we show the application of a technique which circumvents many of the shortcomings of various commonly applied close coupling and perturbation theory approaches, each valid only in a restricted range of impact energy.

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