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Perturbative and Non-Perturbative Calculations of Photoionization of H_2^+[1] M. FOSTER, J. COLGAN, Los Alamos National Laboratory, Theoretical Division, O. HAGAN, J.L. PEACHER, D.H. MADISON, University of Missouri - Rolla, M.S. PINDZOLA, Auburn University — We present both non-perturbative and perturbative calculations for photoionization of H_2^+. For the perturbative approach, we have investigated two different final state wavefunctions for the ionized electron. The first wavefunction is a product of two Coulomb functions (2C) where each Coulomb function represents the two-body interaction between the ionized electron and one of the residual protons in the nucleus. The second final state wavefunction, we investigated was a distorted wave for the ionized electron calculated using a spherically symmetric potential for the two residual protons. These methods are compared to the results computed using the non-perturbative time-dependent method. The time-dependent method solves the time-dependent Schrodinger equation for H_2^+ using the variational principle in spherical coordinates centered on the center of mass of the H_2^+ system.

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