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Exploring the parameter space for ionization and dissociation of H_2^+ in an intense laser pulse[1] VLADIMIR ROUDNEV, B.D. ESRY, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — We explore the dissociation and ionization of H_2^+ ions aligned with a 790 nm laser field of peak intensity in the range 1.0×10^{13} to 7.0×10^{14} W/cm^2. Calculated dissociation and ionization probabilities are reported for different initial vibrational states and for the initial state averaged over the Franck-Condon distribution. The dependence on the carrier-envelope phase difference for different initial states and for pulse durations from 5 to 30 fs FWHM is presented. These results — from direct solution of the time-dependent Schrödinger equation — are compared with solutions in the Born-Oppenheimer representation with two-channels for low peak laser intensities.

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Vladimir Roudnev
J.R. Macdonald Laboratory, Department of Physics, Kansas State University

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