Double Ionization of H$_2$ in Intense Short-Pulse Laser Fields[1] XI-AOXU GUAN, KLAUS BARTSCHAT BARTSCHAT, Drake University, BARRY I. SCHNEIDER, National Science Foundation — We report our development of a nonperturbative time-dependent method to treat one- and two-photon double ionization of the hydrogen molecule by intense ultrashort laser pulses. The two-center two-electron system is discretized in prolate spheroidal coordinates combined with a FE-DVR basis. The solution to the time-dependent laser-driven problem is obtained in the Born-Oppenheimer approximation by propagating the initial state using an effective Arnoldi algorithm. We discuss the dependence of the fully differential cross section for double ionization on the directions of both the molecular and the laser polarization axes. Our results are compared with other recent theoretical predictions.

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Date submitted: 22 Jan 2010   Electronic form version 1.4