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Precision calculation of intense-laser-field multiphoton ionization (MPI) rates of H$_2^+$ at critical internuclear distances$^1$ SANG-KIL SON, SHIH-I CHU, Department of Chemistry, University of Kansas — We extend the time-independent non-Hermitian Floquet formalism [1] for high precision calculation of the MPI rates of H$_2^+$ at internuclear distances ($R$) from 2.0 to 20.0 a.u. in intense laser fields with intensity $1 \times 10^{14}$ W/cm$^2$ and wavelength 791 nm. The procedure involves the use of the complex-scaling generalized pseudospectral (CSGPS) method for non-uniform spatial discretization of the Hamiltonian expressed in prolate spheroidal coordinates. We found that the MPI rates strongly depend upon $R$ and are significantly enhanced at several critical distances ($R \sim 8, 11, \text{ and } 15$ a.u.) in good agreement with the recent experimental results [2]. [1] S. I. Chu and D. A. Telnov, Phys. Rep. 390, 1 (2004). [2] D. Pavićić, A. Kiess, T. W. Hänsch, and H. Figger, Phys. Rev. Lett. 94, 163002 (2005).

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