Abstract Submitted
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Probing molecular dynamics using attosecond transient absorption YAN CHENG, MICHAEL CHINI, XIAOWEI WANG[1], YANG WANG, YI WU, ZENGHU CHANG, CREOL and Department of Physics, University of Central Florida, Orlando, FL 32816, USA — Transient absorption experiments using isolated attosecond pulses have recently been used to uncover fast dynamics in laser-perturbed bound and autoionizing state wavepackets in atoms. Application of this technique to the study of fast dynamics in molecules requires unique attosecond light sources. In particular, since chemical reaction dynamics are driven primarily by valence electron motion, attosecond pulses with low photon energies in the VUV are needed. Here, we apply attosecond transient absorption spectroscopy to the study of vibrational wavepackets in hydrogen molecules. Laser-induced dynamics in the vibrational wavepacket excited by the attosecond pulse through $D \leftarrow X$ vibronic transitions (14-16 eV) are revealed by delay-dependent changes in the vibrational state absorption features. The isolated attosecond pulses produced with generalized double optical gating with low photon energies present a promising route to "filming" chemical reactions in real time.

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