Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

H_2^+ dissociation fragments alignment after few-cycle pulse at mid-infrared regime[1] SHUO ZENG, FATIMA ANIS, BRETT ESRY, J.R.Macdonald Laboratory, Department of Physics, Kansas State University — By solving the time-dependent Schrödinger equation for H_2^+ numerically including nuclear rotation for H_2^+, we systematically analyzed the H_2^+ rotational dynamics after a few-cycle laser pulse for wavelengths in the range 800-2000 nm. This study extends our test of the axial recoil approximation reported in [1] to longer wavelengths. Individual initial vibrational states show different rotational behavior. Generally, dissociation fragments from lower vibrational states tend to anti-align along the laser polarization direction, while the fragments from higher initial states tend to align along the polarization direction. In addition, we found that the carrier-envelope phase does not influence the post-pulse rotation substantially even for the few-cycle pulse.

[1] F. Anis, T. Cackowski, and B. D. Esry, J. Phys. B 42, 091001 (2009)

[1]Supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy.

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Date submitted: 04 Feb 2011 Electronic form version 1.4