Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Fully angle-resolved strong-field ionization and dissociation of ethylene from rotational wavepacket dynamics[1] VINOD KUMARAPPAN, XIAOMING REN[2], ANH-THU LE, VARUN MAKHIJA[3], Kansas State University
— We obtain the full orientation dependence of strong field ionization and dissociation of ethylene, an asymmetric top molecule, by a linearly polarized laser pulse. The molecules are set into complex rotational motion by the non-resonant laser pulse and subsequently ionized or fragmented by a more intense probe pulse. By decomposing the delay dependent yields of ionization dissociation products in a suitable basis set, we obtain the orientation dependences of both processes and show that HOMO and HOMO-1 orbitals contribute to the ionization signal and that ionization from HOMO-1 and HOMO-2 lead to emission of a hydrogen atom. The time-dependent angular distribution and the initial rotational temperature of the molecules are also obtained from the same analysis.

[1]This work was supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy.
[2]Current Affiliation: University of Central Florida
[3]Current Affiliation: University of Ottawa

Vinod Kumarappan
Kansas State University

Date submitted: 02 Feb 2015 Electronic form version 1.4