Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Fragmentation of H_2^+ molecules irradiated by intense 395 nm femtosecond laser pulses: a coincidence 3D momentum imaging study.[1]
JARLATH MCKENNA, A. MAX SAYLER, P.Q. WANG, BISHWANATH GAIRE, NORA G. JOHNSON, ELI PARKE, F. ANIS, JIANJUN HUA, B.D. ESRY, KEVIN D. CARNES, ITZIK BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — As the most fundamental molecule, H_2^+ is the natural choice of study to understand fast molecular response to intense ($> 10^{12}$ W cm^{-2}) short pulse (< 100 fs) laser fields. Previously this molecular ion, prepared as a fast ($\sim$10 keV) target, has been explored by our group using a 790 nm Ti:Sapphire laser revealing, for example, interesting structure in the ionization channel attributed to above-threshold Coulomb explosion. Using the second harmonic of this frequency (395 nm light) provides better energy resolution of photon-order dependent processes. As such we present here a coincidence 3D momentum imaging study of H_2^+ at this wavelength and compare the results to those using 790 nm light centering the discussion on both the ionization and dissociation channels. A theoretical interpretation of the results is offered.

[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: 05 Feb 2007 Electronic form version 1.4