Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Asymmetric fragmentation of D_2H^+ by intense ultrashort laser pulses[1] J. MCKENNA, A.M. SAYLER, B. GAIRE, NORA G. JOHNSON, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — The triatomic hydrogen molecular ion is a fundamentally important molecule as it plays a key role in interstellar and plasma chemistry. More importantly for intense laser studies, it is seen as the stepping stone to better understanding the laser-driven dynamics of polyatomic molecules. Recently, we have made a breakthrough by performing the first studies on H_3^+ and D_3^+ fragmentation in ultrashort intense laser pulses using coincidence 3D momentum imaging. Studying the D_2H^+ isotopologue, we now find exciting differences between equivalent breakup channels. For example, for 7 fs, 790 nm pulses the 2-body single ionization channel, H^++D_2^+, is a factor of 5 larger than its counterpart channel, D^++HD^+. Wavepacket propagation calculations are needed to determine the precise origin of the effect.

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

Jarlath McKenna
J.R. Macdonald Laboratory, Dept of Physics, Kansas State University

Date submitted: 27 Jan 2009 Electronic form version 1.4