

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Ionization and Coulomb explosion of small hydrocarbons exposed to short intense laser pulses¹ SERGIY BUBIN, KALMAN VARGA, Vanderbilt University — We have performed first principles numerical simulation of high field ionization in small hydrocarbons followed by a Coulomb explosion. The process was driven by 790 nm 27 fs laser pulses of high intensity (of the order of 10^{15} W/cm²), for which case there exists recent experimental data [S. Roither et al., Phys. Rev. Lett. 106, 163001 (2011)]. We have analyzed the spectra of ejected protons and investigated the ionization-fragmentation mechanism that takes place when molecules are subjected to short intense laser pulses. The results of our simulations support the all-at-once (concerted) fragmentation scenario proposed by Roither et al. At the same time we also observed some quantitative differences between the theoretical and experimental spectra.

¹This work has been supported by NSF (grant CMMI-0927345)

Sergiy Bubin
Vanderbilt University

Date submitted: 09 Nov 2011

Electronic form version 1.4