Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Femtosecond Photoelectron Imaging of Dissociating and Autoionizing States in Oxygen[1] ALEXANDER PLUNKETT, ARVINDER SANDHU, Univ of Arizona — Time-resolved photoelectron spectra from molecular oxygen have been recorded with high energy and time resolution using a velocity map imaging (VMI) spectrometer. High harmonics were used to prepare neutral Rydberg states converging to the $c^4\Sigma_u^-$ ionic state. These states display both autoionization and predissociation.[2] A femtosecond laser pulse centered at 780 nm was used to probe the system, ionizing both the excited molecular states and the predissociated neutral atomic fragments. Electrons were collected in the 0-3 eV range using a VMI spectrometer and their spectra were reconstructed using a Fast Onion-peeling algorithm. By looking at IR modification to the electron spectrum, new features are observed which could originate from long-range columbic interactions or previously unobserved molecular decay channels. Ongoing studies extend this technique to other systems exhibiting non-adiabatic dynamics.

[1]This work was supported by the U. S. Army Research Laboratory and the U. S. Army Research Office under Grant No. W911NF-14-1-0383.
[2]H. Timmers, N. Shivaram, and A. Sandhu, Phys. Rev. Lett. **107**, 173001 (2012)

Alexander Plunkett
Univ of Arizona

Date submitted: 27 Jan 2017 Electronic form version 1.4