Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Observing Superexcited State Dynamics in Atomic and Molecular Systems by Attosecond Transient Absorption CHEN-TING LIAO, College of Optical Sciences and Department of Physics, University of Arizona, XUAN LI, DANIEL HAXTON, Ultrafast X-ray Science Laboratory, Chemical Sciences Division, Lawrence Berkeley National Laboratory, ROBERT LUCCHESE, Chemistry Department, Texas AM University, C. WILLIAM MCCURDY, Department of Chemistry, University of California, Davis, ARVINDER SANDHU, College of Optical Sciences and Department of Physics, University of Arizona — The electron dynamics of superexcited atomic and molecular states are studied experimentally and theoretically. For atomic systems, such as $3s3p^6 5p$ autoionizing state in argon, delay-dependent optical density (OD) only shows positive changes. However, molecular system such as Oxygen shows positive OD in the case of $ns\sigma_g$ and $ns\pi_g$ autoionizing states of oxygen and negative OD for $nd\sigma_g$ states. The negative OD change corresponds to the reduced absorption comparing to the static continuum background. We investigated this electron symmetry dependent effect in depth experimentally by attosecond transient absorption spectroscopy, and theoretically by multiconfiguration time-dependent Hartree-Fock (MCTDHF) method.

Chen-Ting Liao
College of Optical Sciences and Department of Physics, University of Arizona

Date submitted: 28 Jan 2016 Electronic form version 1.4