

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Time-Resolved Two-Color X-ray Pump/ X-ray Probe Photoelectron Spectroscopy¹ A AL HADDAD, A PICON, M BUCHER, G DOUMY, 1, R COFFEE, M HOLMES, J KRZYWINSKI, A LUTMAN, A MARINELLI, S MOELLER, T OSIPOV, 2, S PRATT, 1, D RATNER, P WALTER, D RAY, 2, L YOUNG, S SOUTHWORTH, C BOSTEDT, 1, ANL TEAM, SLAC TEAM — Recently, X-ray Free Electron Lasers proved the ability to produce two intense femtosecond x-ray pulses with controlled time delay and color. Combining these unique capabilities with X-ray photoelectron spectroscopy (XPS), a powerful tool for extracting chemical information of a specific site by measuring the binding energy of core electrons, enables femtosecond time-resolved XPS experiments with chemical and site specificity. Such technique allows us to observe electronic and nuclear dynamics of out of equilibrium states. We will present our work on X-ray pump/X-ray probe XPS experiment in CO gas, where we excited a core-hole on the oxygen site and probed the carbon. We observe electronic and nuclear dynamics in the first 40fs. We will further discuss our followup experiment and the future of such techniques in the light of the recent developments related to atto-second pulses at XFELs.

¹Work was supported by the U.S. Department of Energy, Office of Science, Chemical Sciences, Geosciences, and Biosciences Division

Andre Al Haddad
Argonne National Laboratory

Date submitted: 26 Jan 2018

Electronic form version 1.4