

Abstract Submitted  
for the DAMOP11 Meeting of  
The American Physical Society

**Creating double core hole two sites in N<sub>2</sub> molecules using the Linac Coherent Light Source** LI FANG, BRENDAN MURPHY, TIMUR OS-IPOV, PAVLE JURANIC, NORA BERRAH, Physics Department, Western Michigan University, USA, EDWIN KUKK, Department of Physics and Astronomy, University of Turku, Finland, MOTOMICHI TASHIRO, MASAHIRO EHARA, IMS, Japan, KIYOSHI UEDA, IMRAM, Tohoku University, Japan, KEVIN C. PRINCE, ROBERT RICHTER, Sincrotrone Trieste S.c.p.A., Italy, RAIMUND FEIFEL, Department of Physics and Astronomy, Uppsala University, Sweden, PETER SALEN, PETER VAN DER MEULEN, HENNING SCHMIDT, RICHARD D. THOMAS, MATS LARSSON, Department of Physics, Stockholm University, Sweden — We have measured double core hole two sites in N<sub>2</sub> molecules using the intense short x-ray laser pulses from the Linac Coherent Light Source free electron laser. This is achieved within the time scale of the single-core-hole state lifetime via sequential core ionization. This work extends previous work [1, 2] and demonstrates that both photoelectron and Auger spectroscopy allow the measurement of double core hole two sites. The latter are very sensitive to the chemical environment and present a new chemical analysis tool. This work was supported in part by the DOE-SC-BES, Chemical Sciences, Geosciences and Biosciences Division. [1] L. Fang *et al.*, Phys. Rev. Lett. **105**, 083005 (2010). [2] J. Cryan *et al.*, Phys. Rev. Lett. **105**, 083004 (2010).

Li Fang  
Physics Department, Western Michigan University, USA

Date submitted: 04 Feb 2011

Electronic form version 1.4