

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

**Insights on the Dissociation Dynamics of Ammonia Through
Core-Hole Molecular Frame X-Ray Photoelectron Angular Distributions¹**

CYNTHIA TREVISAN, California State University Maritime Academy, JOSHUA WILLIAMS, University of Nevada, Reno, THORSTEN WEBER, THOMAS RESCIGNO, Lawrence Berkeley National Laboratory, REINHARD DÖRNER, TILL JAHNKE, MARKUS SCHÖFFLER, Institut für Kernphysik, J. W. Goethe Universität, ALLEN LANDERS, Auburn University, CLYDE MCCURDY, University of California, Davis — We present experimental and theoretical results for the angular dependence in the body frame of electrons ejected from the core orbitals of ammonia that verify the imaging effect predicted earlier by which the molecular frame photoelectron angular distributions (MFPADs) for removing an electron from a 1s orbital effectively image the geometry of a class of molecules. Ammonia with a 1s vacancy undergoes double Auger decay to produce, in one channel, 3 protons and a neutral N atom, allowing the determination of the MFPAD in a four-particle coincidence experiment. Calculations have predicted an imaging effect in a class of molecules whereby the electron ejected by core photoionization has the tendency to follow molecular bonds if averaged over directions of polarization of the incident X-ray beam. We combine experimental results to quantum chemistry calculations to investigate the dissociation dynamics of ammonia after double Auger decay. Our measurements employ the COLTRIMS method and the calculations were performed with the Complex Kohn Variational method.

¹Office of Basic Energy Sciences, U.S. DOE DE-AC02-05CH11231

Cynthia Trevisan
California State University Maritime Academy

Date submitted: 16 Mar 2018

Electronic form version 1.4