

Abstract Submitted
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Using coherent molecular motion to merge electron diffraction with x-ray spectroscopic results¹ KAREEM HEGAZY, Stanford Univ, PULSE, MARKUS ILLCHEN, SLAC, DESY, JIE YANG, XIAOZHE SHEN, RENKAI LI, THEODORE VECCHIONE, JEFF CORBETT, ALAN FRY, NICK HARTMANN, CARSTEN HAST, KEITH JOBE, IGOR MAKASYUK, JOSEPH ROBINSON, SHARON VETTER, STEPHEN WEATHERSBY, CHARLES YONEDA, XIJIE WANG, SLAC, RYAN COFFEE, SLAC, LCLS, SLAC UED TEAM, LCLS EXPERIMENT AMOI0314 COLLABORATION — Ultrafast electron diffraction (UED) has recently been shown to probe ultrafast time dependent molecular structure. If such structural measurements could be connected to spectroscopic measurements, one could better understand the interaction between the electronic and the nuclear degrees of freedom. As a first step, we diffract MeV scale electrons, time-resolved, following repeated impulsive stimulated Raman excitation of an ensemble wide coherent rotational revival in N₂O. An identical molecular alignment procedure was used in a previous soft x-ray spectroscopic experiment at the Linac Coherent Light Source (LCLS). Both experiments clearly reveal the molecular alignment signature which can be used to merge the data sets.

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