Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Rotational coherence as an alternative to coincidence techniques at x-ray free electron lasers[1] RYAN COFFEE, KAREEM HEGAZY, NICK HARTMANN, PETER WALTER, TIMUR OSIPOV, SLAC, ANTON LINDAHL, Qamcom Research, WOLFRAM HELML, TU Munich, MARKUS ILCHEN, ANDREAS GALLER, JIA LIU, JENS BUCK, EuroXFEL, IVAN SHEVCHUK, JENS VIEFHAUS, DESY, GREGOR HARTMANN, ANDRE KNIE, PHILIPP DEMEKHIN, U Kassel, LUDGER INHESTER, ZHENG LI, BEATA ZIAJAMOTYKA, CFEL, NIKITA MEDVEDEV, Czech Acad. of Sci., CHRISTOPH BOSTEDT, ANL, RENAUD GUILLEMIN, MARC SIMON, CNRS, MARIA NOVELLA-PIANCASTELLI, Uppsala U., CATALIN MIRON, ELI-DC, LCLS-AMOI0314 TEAM — We demonstrate an alternative approach to coincidence particle detection, based on impulsive rotational Raman excitation, for molecular frame measurements at x-ray FELs. A train of 8 infrared laser pulses induces the lab-frame observable coherence. At a field-free alignment revival, we register the angle-resolved laboratory frame Auger and photo-electron spectral feature variations with the tumbling molecular body frame. The time and angle dependence of the electron emission patterns that constrain theory are amenable to large numbers of interactions per pulse and, more importantly, has no axial recoil requirement for kinematic reconstruction. We see this as a method to bypass experimental challenges at XFELs by accepting

[1]The Linac Coherent Light Source (LCLS) is supported by the U.S. DoE-BES Contract No. DE-AC02-76SF0051

Ryan Coffee
SLAC

Date submitted: 29 Jan 2017 Electronic form version 1.4