## Abstract Submitted for the MAR15 Meeting of The American Physical Society

Applications of laser streaking at X-ray free electron lasers GILLES DOUMY, Argonne Natl Lab, CHRIS ROEDIG, LOU DIMAURO, Ohio State University, ADRIAN CAVALIERI, IVANKA GRGURAS, CFEL/University Hambourg, MICHAEL MEYER, XFEL, JOHN COSTELLO, Dublin University, WOLFRAM HELML, ANDREAS MAIER, REINHARD KIENBERGER, MPQ Garching, MARKUS ILLCHEN, NICK HARTMANN, RYAN COFFEE, CHRISTOPH BOSTEDT, SLAC — X-ray radiation has been long used to address selectively atoms and to yield structural information with atomic precision. The advent of X-ray Free Electron Lasers (XFEL) is revolutionizing the field of time resolved x-ray techniques. The availability of tunable pulses ranging from the soft to the hard x-ray region, and lasting only few tens of femtoseconds, or perhaps less, is enabling access to unprecedented temporal resolution. However, knowledge of the temporal properties of the x-ray pulses is poor, and synchronization to external sources introduces a timing jitter that dominates the fast dynamics and needs to be corrected for every shot. Using laser streaking techniques developed by the atto second community, one can measure the pulse duration, and possibly improve the temporal resolution of pump probe experiments where electrons are collected to follow the processes by use of a self-referencing measurement. Illustration is presented following Auger decay in the time domain.

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Date submitted: 14 Nov 2014

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