## Abstract Submitted for the MAR16 Meeting of The American Physical Society

Hard X-ray Pump, X-ray Probe Spectroscopy of Single Crystals.¹ AARON LOETHER, MATT DECAMP, Univ of Delaware, DONALD WALKO, Argonne National Lab — Recent advancements in intense x-ray pulses have made it possible to perform hard x-ray pump probe spectroscopy. Inspired by optical pump probe, we've built a retroreflector for use with synchrotron based x-rays, using Germanium crystals at Bragg condition in place of mirrors, to control relative timing of x-ray pulses and perform time resolved measurements. Testing of multiple versions of the retroreflector was done both experimentally and via simulation; the comparison allows us to show efficiencies achievable theoretically and realistically. A proof of concept time resolved diffraction experiment on a Germanium 111 crystal was performed utilizing high intensity broadband x-ray pulses and the resulting heating and propagated strains were measured by low intensity monochromatic x-ray pulses.

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