Abstract Submitted
for the FWS19 Meeting of
The American Physical Society

**2D Monochromatic X-ray Imaging for Focus Monitoring of High-Power Femtosecond and X-ray Free Electron Lasers**[1] J. TRZASKA, H. SAWADA, T. DAYKIN, L. CHEN, C. SALINAS, U. of Nevada, Reno, C. CURRY, M. GAUTHIER, L. FLETCHER, G. GLENN, M. FROST, S. GLENZER, H.J. LEE, E.C. GALTIER, E. CUNNINGHAM, G. DYER, SLAC, S. JIANG, Y PING, A.J. KEMP, LLNL, Y. SENTOKU, Osaka U. — A combination of an X-ray Free Electron Laser and a high-power laser at the Matter in Extreme Conditions (MEC) at the Linac Coherent Light Source has enabled for studying the rapid changes of plasma conditions relevant to astrophysics and fusion plasmas. Because of tightly focused beams, it is challenging to simultaneously achieve beam profile characterization and data acquisition. In a pump-probe experiment at MEC, we have applied 2D monochromatic x-ray imaging to monitor the pointing of the x-ray beam and a femtosecond laser. Irradiation of a 7.0 keV x-ray beam and the laser on a solid titanium sample produced 4.5 keV K-alpha x rays, which were recorded with a spherical crystal imager. The crystal imager shows that the focusing of the x-ray beam is clearly observed but limited to a spot size of 20x40 $\mu$m$^2$ due to heating by the x-ray beam. Details of the experiment and results of the crystal imager will be presented.

[1]Use of the Linac Coherent Light Source (LCLS), SLAC National Accelerator Laboratory, is supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences and Office of Fusion Energy Sciences under Contract No. DE-AC02-76SF00515. This material is based upon work supported by the National Science Foundation under Grant No. 1707357.

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Date submitted: 04 Oct 2019 Electronic form version 1.4