PS01.11.15 PICOSECOND TIME RESOLVED X-RAY DIFFRACTION FROM SINGLE CRYSTALS. P. M. Rentzepis, P. Chen, and I. V. Tomov. Department of Chemistry, University of California, Irvine, CA 92717, USA

An x-ray diode driven by picosecond 193 nm pulses has been used to generate characteristic x-ray pulses with duration less than 10 ps, at 300 Hz repetition rate. These pulses were employed in pump and probe x-ray diffraction experiments to study the transient structure of single crystals illuminated by picosecond laser pulses. The intensity of scattered x-ray radiation and its spatial distribution were recorded by a 2k X 2k CCD camera designed for direct x-ray imagining. A single Au (111) crystal was illuminated by 1.8 ps laser pulses and probed by x-ray pulses. The theory of x-ray scattering from one dimensionally strained crystal has been applied to describe the experimental results. Changes in x-ray diffraction pattern with 10 ps time resolution were observed. The application of this experimental system for picosecond and nanosecond x-ray diffraction from powder and liquid materials will be discussed.