

Abstract Submitted
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A Prototype Inline Silicon p-i-n Photodiode-Array CMOS7-Based Multiframe Ultrafast Digital X-Ray Camera, MUDXC: A Progress Report¹ G.R. BENNETT, L.D. CLAUS, B.C. TAFOYA-PORRAS, B.W. ATHERTON, T.M. GURRIERI, A.H. HSIA, J.L. PORTER, D.C. TROTTER, Sandia National Laboratories — The Z-Beamlet Laser (ZBL) is a long-pulse, multi-kJ, TW-class device that is routinely used for 2-Frame 6.151-keV curved-bragg-crystal imaging on the Z-Accelerator. For higher energy x-ray imaging requirements, the short-pulse, multi-kJ, PW-class Z-Petawatt Laser (ZPW, 2 kJ in 1-10 ps) is being developed. Presently, time-integrated image plate is our best image-plane detector, but we have initiated a program to develop a prototype inline multiframe ultrafast digital x-ray camera (MUDXC) for more frames, higher sensitivity, and time gating. It will consist of a silicon 256 x 256 pixel p-i-n photodiode array backed with 256 x 256 CMOS7 application specific integrated circuits (ASIC). Each ASIC is capable of four 1 ns gates; 4 images. If successful, the system may be enhanced to a cooled germanium (higher x-ray sensitivity, etc.), multi-megapixel device. As such, it would significantly increase the Z physics return when using either ZBL or ZPW. Progress to date will be reported.

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