

Abstract Submitted
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X-pinch Dynamics Observed with a Sub-200ps Laser MARC MITCHELL, S.A. PIKUZ¹, T.A. SHELKOVENKO², K.M. CHANDLER, D.A. HAMMER, Laboratory of Plasma Studies, Cornell University, Ithaca, NY 14853

— The X pinch has proven itself as both an extraordinary x-ray backlighting source and high energy density plasma. However, much of the interesting physics of an X pinch happens on a time scale that is difficult to observe. The X pinch has been estimated to approach solid density and achieve temperatures greater than 1keV for a brief period of during which there is an intense x-ray burst. This intense x-ray burst, or “bright spot,” is on the order of a micron in size and about 0.1ns in duration. The final stages of implosion leading to the formation of the x-ray burst last only a few nanoseconds. Therefore, images of the X pinch taken with an apparatus that integrates over a few nanosecond is not sufficient to resolve the dynamics of the X pinch during the last critical stages of implosion. In turn, we have designed experiments using a sub-200ps laser pulse to observe several frames of each X-pinch pulse with both shadow and interference images. We hope to provide useful images both for direct observation of X-pinch dynamics and for comparison to codes used to model the X pinch as is currently pursued at Imperial College. This research was supported by DOE Grant DE-FG02-ER54496.

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