

X-RAY IMAGING OF MAGLIF EXPERIMENTS USING A SPHERICALLY-BENT CRYSTAL OPTIC*

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The recent Magnetized Liner Inertial Fusion (MagLIF) experiments performed on Sandia's Z- machine produced significant thermonuclear DD fusion yields that were accompanied by strong x-ray emission [M.R. Gomez *et. al.*, PRL (2014)]. The MagLIF experiments relied on a spherically-bent crystal optic to image the x-ray continuum emission generated during the stagnation phase of the implosion. The stagnation images show a long (6 to 8 mm) and narrow (~100 micron) column of x-ray emission with structure in both directions. This structure may be caused by variations in the electron temperature (T_e) and density (n_e), as well as opacity variations in the surrounding Be pusher. Here we investigate the possible contributions from each of these effects. We will also discuss the development of a diagnostic technique in which T_e and n_e of the DD fuel are inferred from spectra emitted by Fe impurities that become ionized to a He-like charge state.

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