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Reconstruction of Axial Energy Deposition in Magnetic Liner Inertial Fusion Based on PECOS Shadowgraph Unfolds Using the AMR Code FLASH[1] MARISSA ADAMS, U. Rochester, CHRISTOPHER JENNINGS, STEPHEN SLUTZ, KYLE PETERSON, Sandia National Laboratories, PIERRE GOURDAIN, U. Rochester, U. ROCHESTER-SANDIA COLLABORATION — Magnetic Liner Inertial Fusion (MagLIF) experiments incorporate a laser to preheat a deuterium filled capsule before compression via a magnetically imploding liner. In this work, we focus on the blast wave formed in the fuel during the laser preheat component of MagLIF, where approximately 1kJ of energy is deposited in 3ns into the capsule axially before implosion. To model blast waves directly relevant to experiments such as MagLIF, we inferred deposited energy from shadowgraphy of laser-only experiments preformed at the PECOS target chamber using the Z-Beamlet laser. These energy profiles were used to initialize 2-dimensional simulations using by the adaptive mesh refinement code FLASH. Gradients or asymmetries in the energy deposition may seed instabilities that alter the fuel's distribution, or promote mix, as the blast wave interacts with the liner wall. The AMR capabilities of FLASH allow us to study the development and dynamics of these instabilities within the fuel and their effect on the liner before implosion. FLASH was developed in part by the DOE NNSA ASC and DOE Office of Science ASCR-supported Flash Center at the University of Chicago.

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