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## 12.33 Plasma Imaging using High-Speed Solid-State Framing Cameras

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We have begun using a new generation of compact and high-speed hybrid-CMOS digital framing cameras to make time-resolved measurements of the laser heating phase of Magnetized Liner Inertial Fusion (MagLIF) experiments. In the MagLIF target concept, a preheated, magnetized, deuterium-filled Be cylinder is compressed using magnetic direct drive from high-current pulsed power devices such as Sandia's Z-machine. In the experiments reported here, we use the multi-kJ Z-Beamlet laser to heat an underdense gas-cell target. We employ multiple soft x-ray pinhole cameras with axial and side-on lines-of-sight to measure the absolute soft x-ray emission distribution with up to 8 temporally separated images per experiment for each pinhole camera. We also use an 8-frame optical shadowgraphy diagnostic to measure the evolution of the expanding blast wave driven by the laser-heated plasma channel. This combination of x-ray and optical measurements enables us to determine the axial energy and radial temperature distributions for a variety of gas-cell target and laser illumination configurations. Sandia is a multimission laboratory managed and operated by NTESS LLC, a wholly owned subsidiary of Honeywell Int, Inc, for the U.S. DOE's NNSA under contract DE-NA0003525.

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