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Hydrodynamic Design Simulations of XPIV-Compatible Targets using FLASH[1] NITISH ACHARYA, University of Rochester, DANAE POLSIN, Laboratory of Laser Energetics, HUSSEIN ALUIE, RICARDO BETTI, GILBERT COLLINS, University of Rochester, ARIANNA GLEASON, SLAC National Accelerator Laboratory, RYAN RYGG, JESSICA SHANG, University of Rochester —
We are developing an X-ray Particle Image Velocimetry (XPIV) technique at the University of Rochester to study the dynamics of high energy density (HED) materials by combing dynamic compression drivers with coherent light sources. Our recent experiments executed on OMEGA-EP tested titanium-seeded epoxy targets to develop a platform for tracking tracer particles in HED laser-driven flows. The experiments were designed using the one-dimensional (1D) radiation-hydrodynamics code LILAC. Here we present two-dimensional (2D) axially symmetric FLASH simulations of the laser-driven shock compression. The simulations investigate the shock wave's speed as it traverses the material along with the downstream density and pressure. We compare our 2D results with 1D simulations using FLASH and prior LILAC results. These are used to guide improvements in future experimental designs.

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