

Abstract Submitted
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X-ray Phase-Contrast Imaging of Strong Shocks.¹ NIGEL WOOLSEY, LUCA ANTONELLI, MATT KHAN, University of York, ROBBIE SCOTT, KEVIN GLIZE, STFC Rutherford Appleton Laboratory, WOLFGANG THEOBALD, PHIL NILSON, ARNAB KAR, RICCARDO BETTI, LLE University of Rochester, STEFANO ATZENI, University Rome La Sapienza, DIMITRI BATANI, ALEXIS CASNER, LUKE CEURVORST, JOCELAIN TRELA, CELIA, University of Bordeaux, FRANCESCO BARBATO, University of Zurich — We demonstrate x-ray phase contrast enhanced imaging (XPCI) on OMEGA EP as a new imaging platform that offers exceptional spatial and material interface resolution. Phase-contrast enhanced imaging requires an x-ray source with some spatial coherence. This is possible with a laser produced incoherent and broadband x-ray source by matching the source size and the energy spectrum with the distance between the source and the object. We describe the application of XPCI on OMEGA EP and how the challenges of an incoherent source and the close proximity of the source to object are managed. It is necessary to minimize the spatial extent of the source whilst ensuring a sufficient photon flux to make a measurement. This is possible by using short pulse laser, such as OMEGA EP, to provide a bright x-ray source and limit the source size with either a pinhole or a free-standing mass-limited foil target with the foil edge pointing towards the object. We apply the XPCI platform to study a shock wave launched using OMEGA EP long pulse beams.

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