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Turbulent Transport in Magnetized HED Plasmas DEREK SCHAEFFER, Princeton University, WILLIAM FOX, PPPL, Princeton University, GENNADY FIKSEL, U.Michigan, Ann Arbor, AMITAVA BHATTACHARJEE, PPPL, Princeton University, ANATOLY SPITKOVSKY, Princeton University, PATRICK KNAPP, Sandia National Laboratory, JONATHAN DAVIES, Laboratory for Laser Energetics — Anomalously fast diffusion of plasma across magnetic fields has long been recognized in magnetic fusion devices and laser plasmas. Micro-instabilities driven by gradients in plasma parameters give rise to convective flow patterns on meso- to global scales, which leads to correspondingly enhanced diffusion coefficients. While some experiments have demonstrated aspects of anomalous transport in HED plasmas, many aspects remain unknown, and this physics is typically not included in MHD design codes for ICF. We present results from recent experiments on turbulent transport in magnetized HED plasmas on the OMEGA laser facility. A plasma was ablated from a plastic target into a pre-existing magnetic field powered by MIFEDS. The evolution of the global topology of the magnetic fields was imaged with proton radiography, and local plasma parameters including electron temperature and density were measured with 2ω Thomson scattering. The interaction of the laser plasma with the background field was measured for different laser energies, and for different target orientations relative to the field.

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