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Studying the Saturation of Turbulent Small-Scale Dynamo Using HED Plasma Plumes HUI LI, Los Alamos Natl Lab, KIRK FLIPPO, ANDY LIAO, SHENGTAI LI, YINGCHAO LU, Los Alamos National Laboratory, ALEX RASMUS, Los Alamos Natl Lab, SALLEE KLEIN, University of Michigan, CODIE KAWAGUCHI, JOSEPH LEVESQUE, Los Alamos Natl Lab, CAROLYN KURANZ, University of Michigan, CHIKANG LI, MIT — We present the latest results from the Omega-EP experiments on demonstrating the small-scale turbulent dynamo, using a cone design (Liao et al. 2019). Using diagnostics including a 4ω laser beamline for angular filter refractometry and a sheath-accelerated proton beamline for deflectometry, we are able to reliably measure the hydrodynamics and magnetic field of the target plasma and observe the turbulent dynamo over a few nanoseconds of activity across two orders of magnitude in spatial scales between tens of micron and $\sim$ mm. Based on these results, we suggest a new type of experiments on NIF where the plasma volume with dynamo action can be larger and much longer lived. This enables the analysis as the small-scale turbulent dynamo reaches its saturation stage.

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