

Abstract Submitted
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Investigation of Magnetic Field Geometry in Exploding Wire Z-Pinches via Proton Deflectometry¹ DEREK MARISCAL, FARHAT BEG, MINGSHENG WEI, UC San Diego, JEREMY CHITTENDEN, Imperial College, RADU PRESURA, University of Nevada Reno, UC SAN DIEGO COLLABORATION, UNIVERSITY OF NEVADA RENO COLLABORATION, IMPERIAL COLLEGE, LONDON COLLABORATION — It is often difficult to determine the configuration of B-fields within z-pinch plasma systems. Typical laser probing diagnostics are limited by the critical density, and electrical diagnostics are prone to failure as well as perturbation of the system. The use of proton beams launched by high intensity lasers, and the subsequent tracking of their deflected trajectories, will enable access to field measurements in previously inaccessible plasma densities. The experimental testing of this method is performed at the Nevada Test Facility (NTF) using the 10J 0.3ps Leopard laser coupled to the 1.6MA ZEBRA pulsed power generator. MHD simulations of the z-pinch plasmas are performed with the 3D resistive MHD code, GORGON. Protons are then injected and tracked through the plasma using the 3D PIC Large Scale Plasma code in order to produce possible proton image plane data. The first computational demonstration of protons propagating through single wire and x-pinch plasmas, along with comparison to recent experimental data will be presented.

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