

Abstract Submitted
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Proton deflectometry of laser-driven relativistic electron jet from thin foil target¹ CHENGGUN HUANG, S. PALANIYAPPAN, D. C. GAUTIER, R. P. JOHNSON, T. SHIMADA, J. C. FERNANDEZ, Los Alamos Natl Lab, F. S. TSUNG, W. B. MORI, UCLA — Near critical density relativistic electron jets from laser solid interaction carry currents approaching the Alfvén-limit and tens of kilo-Tesla magnetic fields. Such jets are often found in kinetic simulations with low areal density targets, but have not been confirmed experimentally. They may be used for X/gamma-ray generation and is also important for the understanding of post-transparency plasma dynamics. With a short-pulse probe beam at the Trident laser facility, we employed proton deflectometry to infer the jets properties, structure and the long-time dynamics. We develop corresponding GEANT4 simulation model of the proton deflectometry, with input from the kinetic PIC simulations in 2D and quasi-3D geometry, to compare with the experimental radiography images. Detail comparison of the experimental and simulation features in the deflectometry will be discussed.

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