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Characterization of High-Current Relativistic Electron Beam Transport Through Solid-Density Matter Using High-Resolution Imaging of Coherent Transition Radiation M. STORM, J. MYATT, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester — A diagnostic has been developed to measure the emission of coherent transition radiation produced by relativistic electrons emerging from the rear side of laser-illuminated targets. Experiments have been conducted on the Multi-Terawatt (MTW) Laser Facility at the University of Rochester's Laboratory for Laser Energetics. The MTW laser is capable of producing 10-J, 500-fs pulses of 1053-nm-wavelength radiation, which are focused using an $f/2.5$, off-axis parabolic mirror to an intensity in excess of 10^{19} W cm^{-2}. The initial experimental campaign used Al, Fe, Cu, Au, and CH foils of varying thickness, which were shot with varying laser energy. High-resolution images of the rear-side emission show evidence of both electron-beam filamentation and electron-beam annular propagation. In this talk we will present the most recently acquired data and provide a brief description of the diagnostic characteristics and capabilities. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement DE-FC52-92SF19460.

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