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Controlling the Divergence of Laser-Generated Fast Electrons Through Resistivity Gradients in Fast-Ignition Targets A.A. SOLODOV, R. BETTI, K.S. ANDERSON, Laboratory for Laser Energetics and Fusion Science Center, U. of Rochester, J.F. MYATT, W. THEOBALD, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester — The divergence of laser-generated fast electrons is a crucial parameter that determines the incident petawatt laser energy in fast-ignition targets. Experiments and particle-in-cell (PIC) simulations predict a large divergence of laser-generated fast electrons, underlining the importance of finding regimes in which electron divergence can be controlled. This paper investigates the recently suggested scheme of controlling the fast-electron divergence using a resistivity mismatch in structured targets, in the regime of realistic ignition-relevant laser energies and intensities. This analysis applies to ignition-relevant energies of the fast-electron beam, different from most studies and proof-of-principle experiments performed so far for low-energy laser pulses and room-temperature targets. Hybrid-PIC simulations using the code *LSP* are performed for cone-in-shell fast-ignition targets with cones comprised of different material layers. The effects of wires attached to the cone tip to guide hot electrons to the dense core are also investigated. This work was supported by the U.S. Department of Energy under Cooperative Agreement Nos. DE-FC02-04ER54789 and DE-FC52-08NA28302.

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