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Hybrid-PIC Simulations of Shock Formation in Laser-Irradiated Plasmas ADAM TABLEMAN, M. TZOUFRAS, UCLA Department of Physics and Astronomy, F. FIUZA, GoLP/IPFN-LA, Instituto Superior Téchnico, F. TSUNG, UCLA Department of Physics and Astronomy, R.A. FONSECA, GoLP/IPFN-LA, Instituto Superior Téchnico, W.B. MORI, UCLA Department of Physics and Astronomy — Shock generation by hot electron beams (with corresponding energy fluxes ranging from 1e14 W/cm^2 to 1e16 W/cm^2 impinging on high density targets (1e15 1/cm^3) is investigated using the hybrid-PIC version of OSIRIS. The hybrid-PIC code uses a fluid model to follow electron transport at high densities. In these simulations an electron cathode is used as a proxy for hot electrons generated in under-dense regions by laser-plasma interactions. This approach enables control over the composition and energy distribution of the hot electrons entering the high density region, which, in turn, allows the direct study of hot electron energy deposition and the corresponding shock structure. Results on hot electron flux caused by laser energy absorbed in under-dense plasma regions will also be discussed. Understanding how to harness the hot electrons to enhance shock formation will aid in designing Shock Ignition ICF targets with improved yield. Work Supported by the DOE under a Fusion Science Center through a University of Rochester subcontract No. 415025- G and under DE-FG52-09NA29552.

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