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Kinetic simulations of shock ignition targets[1] JOHN TONGE, MICHAIL TZOUFRAS, ADAM TABLEMAN, FRANK TSUNG, WARREN MORI, Department of Physics and Astronomy, University of California, Los Angeles — Kinetic effects during the spike of the drive laser pulse are crucial in assessing the feasibility of the shock ignition scheme for inertial confinement fusion. Specifically, the shock efficiency is a function of the hot electron generation in the under-dense region, the transport of these hot electrons through the plasma, and the energy deposition and the associated shock formation dynamics. In order to provide a detailed description of the underlying physical mechanisms and their interdependence, and to assist target design and the interpretation of experiments, we have initiated an integrated study employing the Particle-In-Cell code OSIRIS, the hybrid-PIC code OSIRIS-H and the 2D3P Vlasov-Fokker-Planck code OSHUN. OSIRIS is used to investigate the absorption of the laser energy in the under-dense corona due to laser-plasma interactions and to provide the detailed structure of the hot electron distribution function. The transport of the hot electrons and the formation of the shock are studied with both OSIRIS-H and OSHUN. We will present preliminary results from our simulations and discuss their implications for shock ignition and more generally for the generation of shocks in laser-irradiated plasmas.

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