

Abstract Submitted
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Hybrid PIC modeling of fast electron transport and magnetic collimation in low-Z hot dense plasmas accessible on the Omega EP laser¹ MINGSHENG WEI, FARHAT BEG, University of California, San Diego, RICHARD STEPHENS, General Atomics — A large uniform low-Z hot (20 eV - 100 eV) and dense (0.2 g/cc - 1.0 g/cc) plasma can be produced with multiple kJ energies, long pulse laser beams at the Omega-EP facility. Then OMEGA EP short pulse laser can be used to produce fast electrons. Study of fast electron propagation in such plasmas is of great importance to fast ignition of inertial confinement fusion. In this work, we use the hybrid particle-in-cell (PIC) code LSP to systematically investigate the propagation and energy transport of fast electrons produced by the EP ultrahigh intensity short pulse in such hot dense plasmas with the abovementioned plasma densities and temperatures. Preliminary results show resistive collimation and beam filamentation under various plasma conditions. In addition, effects of an externally applied magnetic field (MG) on the collimation of fast electrons beam and the resultant improved energy transport have been observed.

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