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The Role of Electron Transport in Generating Ion Shocks in Dense Targets Irradiated by Intense, Short Laser Pulses M. SHERLOCK, R. BINGHAM, Rutherford Appleton Laboratory, P. NORREYS, Rutherford Appleton Laboratory, Chilton, Didcot, Oxon — Ion shocks may be generated after the interaction of an intense, short laser pulse with a dense target (e.g. pre-compressed DT fuel capsules). The source for ion acceleration is the electric field determined by the distribution of electrons. We study the role played by the transport of fast electrons through the target during the laser pulse and their subsequent relaxation to some thermal distribution on the field generation and ion dynamics. We make use of a 1 D2P Vlasov-Fokker-Planck model, coupled to Maxwell's equations, to describe the electron transport with an assumed hot electron generation mechanism. The electric field is determined by the balancing of the collisionless forward and collisional return currents through the target. The ions may be described either by a simple hydrodynamic model or an ion particle model which allows for relaxation of the shock via ion-ion collisions.

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