Abstract Submitted
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Validation of Non-Local Electron Transport Approaches, Application to Shock Ignition[1] ALBERTO MAROCCHINO, S. ATZENI, A. SCHIAVI, Università di Roma La Sapienza and CNISM, Italy, M. TZOUFRAS, UC Los Angeles, CA, USA, J. MALLET, PH. D. NICOLAÏ, J.L. FEUGEAS, V. TIKHONCHUK, Université Bordeaux, CEA, CNRS, CELIA, Talence, France, A.R. BELL, University of Oxford, UK — For laser-plasma interactions at moderate intensities the conduction of heat cannot be captured by the classical Spitzer-Härm expression and an accurate treatment for non-local electron transport is necessary. A suitable method needs to discriminate between local electrons, that behave in accordance to the classical thermal conduction, and non-local electrons, that have very long mean free paths and diffuse energy all over the physical domain. Two widely known and promising schemes are examined in detail: SNB [Schurtz et al. PoP (2000)] and CMG [Manheimer et al. PoP (2008)]. Both models have been implemented in the hydrodynamic code DUED and benchmarked against the fully kinetic Vlasov-Fokker-Plank codes OSHUN and KETS. Both schemes calculate the right amount of flux in the limit of steep temperature gradients, and for the test problem of hot-spot relaxation they are both generally well-behaved at hydrodynamic time-scales ($\sim 30\tau_{\rm ei}$). However, at kinetic time-scales (up to $\sim 30\tau_{\rm ei}$) the SNB model better approximates the kinetic solution. 1D and 2D shock ignition simulations will be presented and the role of non-local effects in the implosion and ignition stages will be discussed.

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