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Numerically robust and efficient nonlocal electron transport in 2D DRACO simulations DUC CAO, JEFF CHENHALL, GREG MOSES, University of Wisconsin-Madison, JACQUES DELETTREZ, TIM COLLINS, University of Rochester Laboratory for Laser Energetics — An improved implicit algorithm[1] based on Schurtz, Nicolai and Busquet (SNB) algorithm[2] for nonlocal electron transport is presented. Validation with direct drive shock timing experiments[3] and verification with the Goncharov nonlocal model[4] in 1D LILAC simulations demonstrate the viability of this efficient algorithm for producing 2D lagrangian radiation hydrodynamics direct drive simulations. Additionally, simulations provide strong incentive to further modify key parameters within the SNB theory, namely the "mean free path." An example 2D polar drive simulation to study 2D effects of the nonlocal flux as well as mean free path modifications will also be presented. This research was supported by the University of Rochester Laboratory for Laser Energetics.

[1]Private communications with M. Marinak and G. Zimmerman, LLNL.
[2]Schurtz, Nicolai and Busquet, "A nonlocal electron conduction model for multidimensional radiation hydrodynamics codes," Phys. Plasmas 7, 4238(2000).
[3]T. Boehly, et. al., "Multiple spherically converging shock waves in liquid deuterium," Phys. Plasmas 18, 092706(2011).
[4]V. Goncharov, et. al., "Early stage of implosion in inertial confinement fusion: Shock timing and perturbation evolution," Phys. Plasmas 13, 012702(2006).

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