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Neutron Output Reduction Mechanisms in NIF Implosion Targets[1] R.J. MASON, R.J. FAEHL, R.C. KIRKPATRICK, Research Applications Corp — Using the implicit/hybrid 2D simulation code ePLAS, we explore non/local and kinetic mechanisms that may reduce neutron output in thin shell NIF target implosions. These include: 1) shock precursors, possibly driven by external hot electrons that can pre-compress the central DT fuel core and lead to its inhomogeneity, 2) the effective cooling of the central fuel from the diffusive escape of the hottest ions to cooler regions, and 3) a pre-advance [1] of the D ions ahead of the T ions, due to the attractive electric field retaining electrons in the imploding fuel shell, and leaving the central fuel richer in D ions but at too low a temperature to burn effectively. The calculations use multiple ion fluids and/or PIC particle ions with background, cold fluid electrons and fluid or PIC hot electrons. All these components are jointly collisional. E & B-fields are computed by the Implicit Moment Method for stability with economy, using a new super-hybrid method that can be run on the ion Courant time scale. Spontaneous thermoelectric $B-$fields can alter thermal conductivities and amplify inhomogeneities. We discuss possible yield optimization techniques.

[1] P. Amendt et al., Phys. Plasmas **18**, 056308 (2011).

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