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Modeling of Kinetically Enhanced Mixing of High Z Material into Fuel via Double Layer Electric-Field WILLIAM TAITANO, University of New Mexico, DANA KNOLL, LUIS CHACON, Los Alamos National Laboratory, ANIL PRINJA, University of New Mexico — The national ignition campaign has come to an end without achieving ignition of the fuel. An experimental observation that has been consistently made is a low fuel temperature. The low fuel temperature may be attributed to the radiative heat-loss due to kinetically enhanced high Z impurities mixing. In omega capsule experiments, a strong electric-field, consistent with charge-separation field has been detected [1]. It has been suggested that the source of this field is a strong shock propagation, but a strong ionization gradient at the interface could also be a source [2]. Such a strong field located at the fuel-pusher interface may accelerate higher Z materials into the fuel region, causing mix. To study the kinetically enhanced mixing phenomena, we develop a fully implicit, Vlasov-Fokker-Planck solver. We evolve the self-consistent, charge-separation field from the Ampere equation. We include two kinetic ion species (one for DT fuel and one for capsule material) and kinetic electron species in our model. We present results which supports the existence of the strong field at the interface and enhanced mixing of pusher material into fuel.

[1] C.K. Li et al. PRL, 100, 225001 (2008).

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