Abstract Submitted
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Kinetic Effects at Material Interfaces in ICF Implosions[1] S.C. WILKS, W. CABOT, H. WHITLEY, J. GREENOUGH, B.I. COHEN, J. BELOF, G. ZIMMERMAN, P.A. AMENDT, S. LEPAPE, L. DIVOL, A. DIMITS, F. GRAZIANI, LLNL, K. MOLVIG, E. DODD, LANL, C.K. LI, R. PETRASSO, MIT, S. LAFFITE, O. LARROCHE, M. CASANOVA, L. MASSE, CEA — The mixing of materials at an interface during an ICF implosion, for example the DT- Carbon interface in an ICF capsule, is a complex process. In general, rad-hydro codes do an excellent job of modeling the important processes during an ICF implosion. However, there are certain times during the implosion when kinetic effects of the ions may play a role in how two materials mix across the interface between them, even in the absence of shocks moving through them. The Knudsen layer effect is one such example. We will describe results of multi-ion species hybrid LSP simulations where the ions are treated kinetically and the electrons are treated as a fluid. We observe that the DT and carbon ions diffuse across the interface in a self-similar manner, at a rate proportional to the square root of time, in agreement with diffusion theory. The resulting ion distributions for each species (on both sides of the interface) will be presented, and the result of this mixing on the yield will be discussed for ICF capsules. Preliminary results of a related mixing that occurs at the gas-hohlraum wall interface will also be presented.

[1] K. Molvig, et al., PRL, **109**, 095001 (2012)
[2] D. R. Welch, et al, Nucl. Instrum. Methods Phys. Res. A **464** 134-139 (2001).
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