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Application of a New Turbulent Transport Model to Double-Shell Inertial Confinement Fusion Capsule Implosions[1] OLEG SCHILLING, HARRY ROBEY, PETER AMENDT, Lawrence Livermore National Laboratory — Recent progress in the modeling of the performance of non- cryogenic double-shell inertial confinement fusion capsules is discussed. A new two-equation eddy viscosity-based K- ϵ turbulent transport and mixing model is briefly described and then applied to a set of double-shell capsules with glass and plastic inner shells. One- and two-dimensional simulations are presented and compared to measurements previously obtained from experiments on the OMEGA laser. It is shown that the model predictions, using coefficients consistent with both high resolution numerical simulation data of Rayleigh- Taylor instability-induced turbulence and with analytical solutions of the model in particular limiting cases, are well within the uncertainties of the experimentally measured capsule yields. Various quantities from the capsule simulations are discussed and interpreted physically within the context of both ICF physics and turbulence.

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