Abstract Submitted
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A New Theory of Mix in Omega Capsule Implosions[1] DANA KNOLL, LUIS CHACON, RICK RAUENZAHN, ANDREI SIMAKOV, WILLIAM TAITANO, LESLIE WELSER-SHERRILL, LANL — We put forth a new mix model that relies on the development of a charge-separation electrostatic double-layer at the fuel-pusher interface early in the implosion of an Omega plastic ablator capsule. The model predicts a sizable pusher mix (several atom %) into the fuel. The expected magnitude of the double-layer field is consistent with recent radial electric field measurements in Omega plastic ablator implosions. Our theory relies on two distinct physics mechanisms. First, and prior to shock breakout, the formation of a double layer at the fuel-pusher interface due to fast preheat-driven ionization. The double-layer electric field structure accelerates pusher ions fairly deep into the fuel. Second, after the double-layer mix has occurred, the inward-directed fuel velocity and temperature gradients behind the converging shock transports these pusher ions inward. We first discuss the foundations of this new mix theory. Next, we discuss our interpretation of the radial electric field measurements on Omega implosions. Then we discuss the second mechanism that is responsible for transporting the pusher material, already mixed via the double-layer deep into the fuel, on the shock convergence time scale. Finally we make a connection to recent mix motivated experimental data on

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