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Depth and Extent of Gas-Ablator Mix in Symcap Implosions at the National Ignition Facility[1] JESSE PINO, T MA, S A MACLAREN, J D SALMONSON, D HO, S F KHAN, L MASSE, J E RALPH, C CZAJKA, D CASEY, R SACKS, V A SMALYUK, R E TIPTON, G A KYRALA, Lawrence Livermore Natl Lab — A longstanding question in ICF physics has been the extent to which capsule ablator material mixes into the burning fusion fuel and degrades performance. Several recent campaigns at the National Ignition Facility have examined this question through the use of separated reactants. A layer of CD plastic is placed on the inner surface of the CH shell and the shell is filled with a gas mixture of H and T. This allows for simultaneous neutron signals that inform different aspects of the physics; we get core TT neutron yield, atomic mix from the DT neutrons, and information about shell heating from the DD neutron signal. By systematically recessing the CD layer away from the gas boundary we gain an inference of the depth of the mixing layer. This presentation will cover three campaigns to look at mixing depth: An ignition-like design (Low-foot) at two convergence ratios, as well as a robust, nearly one-dimensional, low convergence, symmetric platform designed to minimize ablation front feed-through (HED 2-shock). We show that the 2-shock capsule has less ablator-gas mix, and compare the experimental results to mix-model simulations.

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