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Testing Radiation Trapping Efficiency for Double Shell Inertial Confinement Fusion Targets[1] JOHN KLINE, Los Alamos Natl Lab, S. M. FINNEGAN, W. S DAUGHTON, D. S. MONTGOMERY, LANL — We present experimental concepts for testing the efficiency of radiation "trapping" by high-Z materials for Inertial Confinement Fusion (ICF) capsules. ICF requires heating of the Deuterium-Tritium (DT) fuel by alpha particles released during fusion reactions at a rate higher than losses by heat conduction or radiation. A layer of high-Z material on the inner surface of a capsule next to the burning DT gas reduces radiation losses reducing the required gas temperature to exceed the self-heating threshold. It is hypothesized the radiation trapping efficiency for capsule implosions may be reduced by hydrodynamic instabilities affecting the shape of the high-Z layer. The distorted shape changes the efficiency of radiation trapping by increasing the surface area, thinning regions of the shell, and/or changing the radiation view factor. Assessing the efficiency of radiation trapping is critical for double shell capsule designs. We have developed experimental concepts to test the effects of the shape of high-Z materials on radiation trapping. The experimental designs and supporting simulations will be included in this presentation.

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