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NIF Double Shell outer/inner shell collision experiments[1] E. C. MERRITT, E. N. LOOMIS, D. C. WILSON, T. CARDENAS, D. S. MONTGOMERY, W. S. DAUGHTON, E. S. DODD, T. DESJARDINS, D. B. RENNER, S. PALANIYAPPAN, S. H. BATHA, Los Alamos National Lab, S. F. KHAN, V. SMALYUK, Y. PING, P. AMENDT, Lawrence Livermore National Lab, M. SCHOFF, M. HOPPE, General Atomics — Double shell capsules are a potential low convergence path to substantial alpha-heating and ignition on NIF, since they are predicted to ignite and burn at relatively low temperatures via volume ignition. Current LANL NIF double shell designs consist of a low-Z ablator, low-density foam cushion, and high-Z inner shell with liquid DT fill. Central to the Double Shell concept is kinetic energy transfer from the outer to inner shell via collision. The collision determines maximum energy available for compression and implosion shape of the fuel. We present results of a NIF shape-transfer study: two experiments comparing shape and trajectory of the outer and inner shells at post-collision times. An outer-shell-only target shot measured the no-impact shell conditions, while an imaging double shell shot measured shell conditions with impact. The imaging target uses a low-Z inner shell and is designed to perform in similar collision physics space to a high-Z double shell but can be radiographed at 16keV, near the viable 2DConA BL energy limit.

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