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Studying the inner shell of a Double Shell implosion via high-energy x-rays PAUL KEITER, ERIC LOOMIS, JOSH SAUPPE, DAVID MONTGOMERY, RYAN SACKS, TANA CARDENAS, DOUG WILSON, SASIKUMAR PALANIYAPPAN, LYNN KOT, Los Alamos National Laboratory, SCOTT VONHOF, General Atomics, SCOTT JOHNSON, COHL HOULDIN HATALA, JEREMY KROLL, DAVID MARTINEZ, DAN KALANTAR, Lawrence Livermore National Laboratory — Double shell capsules provide a complementary and alternative path to the single shell inertial confinement fusion (ICF) approach. Generically, a double shell capsule consists of an outer shell, a medium between the shells and a high-Z inner shell filled with DT fuel. Double shell targets rely on effectively transferring the kinetic energy of the outer shell to the inner shell to compress the DT fuel. We need to understand the shape of the inner shell surface pushing against the DT, however, current designs use a W or Au inner shell, requiring MeV x-rays to radiograph the inner shell. Surrogate inner shell materials such as Cr allow one to study the same physics and can be radiographed with much lower-energy x-rays (10's of keV). We have developed a plan to study the evolution and shape of the inner shell starting with surrogate materials and utilizing the Advanced Radiographic Capability (ARC) on the National Ignition Facility (NIF). We will discuss our experimental requirements and our plans to utilize ARC to radiograph the inner shell during the implosion.

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