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Experimental evaluation of the x-ray preheat of fast-ignition cones[1] NOBUHIKO IZUMI, R.P.J. TOWN, M.J. MAY, H.F. ROBEY, D.S. CLARK, A.J. MACKINNON, P.A. AMENDT, M.H. KEY, P.K. PATEL, E. STORM, M. TABAK, Lawrence Livermore National Laboratory, IDFI TEAM —
In planned fast-ignition implosions, a gold cone will be inserted into the capsule to allow a short-pulse laser to directly irradiate the compressed fuel without having to propagate through the ablated shell plasma [M. Tabak et al., Fus. Science and Technol., 49, 254 (2006)]. For the case of indirect-drive implosions, L-band line emission from the gold hohlraum wall (8∼13 keV) can penetrate though the shell and heat the outer 2-6 μm of the cone, causing the gold to expand and mix with the fuel. Since mixing of high-Z material with the fuel reduces the margin for achieving ignition, it is important to quantify the L-shell emission from Au hohlraums and to evaluate the effects on the Au cone. We measured the absolute x-ray flux from thin-wall (5 μm thick) gold hohlraums at the OMEGA laser facility, and we have observed the expansion of a surrogate gold surface with time-gated radiography. Results from these experiments will be discussed.

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