Abstract for an Invited Paper
for the DPP05 Meeting of
The American Physical Society

Capsule implosions driven by dynamic hohlraum x-rays

JAMES BAILEY, Sandia National Laboratories

Dynamic hohlraum experiments at the Z facility already implode capsules with up to 80 kJ absorbed x-ray energy. However, many challenging issues remain for ICF. The present experiments use diagnostic capsules to address two of these issues: symmetry measurement and control and building understanding of the capsule/hohlraum implosion system. A suite of x-ray spectrometers record time and space resolved spectra emitted by Ar tracer atoms in the implosion core, simultaneously from up to three different quasi-orthogonal directions. Comparing the results with simulation predictions provide severe tests of understanding. These data also can used to produce a tomographic reconstruction of the time resolved core temperature and density profiles. X-ray and neutron diagnostics are used to examine how the implosion conditions change as the capsule design changes. The capsule design changes include variations in CH wall thickness and diameter, Ge-doped CH shells, and SiO_2 shells. In addition, a new campaign investigating Be capsule implosions is beginning. Be capsules may offer superior performance for dynamic hohlraum research and it may be possible to investigate NIF-relevant Be implosion issues such as the fill tube effects, sensitivity to columnar growth associated with sputtered Be capsule fabrication, and the effect of Cu dopants on implosion conditions. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the U.S. Dept. of Energy under contract No. DE-AC04-94AL85000. * In collaboration with G.A. Rochau, G.A. Chandler, S.A. Slutz, P.W. Lake, G. Cooper, G.S. Dunham, R.J. Leeper, R. Lemke, T.A. Mehlhorn, T.J. Nash, D.S. Nielsen, K. Peterson, C.L. Ruiz, D.B. Sinars, J. Torres, W. Varnum, Sandia; R.C. Mancini, T.J. Buris-Mog, UNR; I. Golovkin, J.J. MacFarlane, PRISM; A. Nikro, D. Steinman, J.D. Kilkenny, H. Xu, General Atomics; M. Bump, T.C. Moore, K-tech; D.G. Schroen, Schafer