DPP07-2007-000148

Abstract for an Invited Paper
for the DPP07 Meeting of
the American Physical Society

Radiation Transport through Inhomogeneous Materials[1]

PAUL KEITER, Los Alamos National Laboratory

Calculations of radiation transport in heated materials are greatly complicated by the presence of regions in which two or more materials are inhomogeneously mixed. This phenomenon is important in many systems, including inertial confinement fusion (ICF), where mixing can occur from instability growth and in astrophysical systems where density clumps can be found in star-forming regions and molecular clouds. We describe laboratory experiments designed to test the modeling of radiation transport through inhomogeneous plasmas. A laser-heated hohlraum is used as a thermal source to drive radiation through polymer foam containing randomly-distributed gold particles. We present experimental measurements of radiation transport in foams with gold particle sizes ranging from 5-9 micron to sub-micron diameters as well as the homogeneous foam case. We also compare simulation results of the radiation transport to the experiment. This was performed by the Los Alamos National Laboratory under the auspices of the United States Department of Energy under contract no. W-7405-ENG-36.

[1]Coauthors: Mark Gunderson (LANL) John Foster, Paula Rosen, Mark Taylor and Andrew Comley (AWE)