Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Laser Generated Anisotropic Drives for Radiation Transport Validation N.E. LANIER, J.K. KLINE, J.D. HAGER, Los Alamos National Laboratory — Many astrophysical phenomena are studied in the laboratory by developing a scaled platform whose energy drive is produced via a laser or pulsed power facility. The push to reach more energetic regimes often results in radiation drives that diverge from well-behaved Lambertian Planckian sources. In these cases, typical diffusive radiation flow models can break down. A new platform, that deliberately generates a well-characterized non-Planckian, anisotropic source, has been developed for the OMEGA laser. The resulting data will help validate more complex computational transport schemes like Sn or implicit Monte-Carlo (IMC) models. The platform contains a SiO_2 foam mounted on a half-hohlraum. Anisotropy is achieved by inserting an obstruction of either a singular round aperture or annular ring between the foam and hohlraum. In addition, a thin beryllium layer delays the thermal component of the drive while the higher energy M-shell radiation propagates unhindered. The result is a highly non-Planckian, anisotropic, supersonic drive that eventually transitions to sub-sonic. Spectroscopic measurements constrain the source anisotropy, magnitude, and spectral content. Moreover, the Marshak position coupled with spectroscopic absorption measurements quantify the foam's internal energy.

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Date submitted: 11 Jul 2013 Electronic form version 1.4