Abstract Submitted
for the FWS14 Meeting of
The American Physical Society

X-ray image and x-ray burst features of under-dense plasma produced in high-density gas jets on the Leopard Laser at UNR[1]

K.A. SCHULTZ, V.L. KANTSYREV, A.S. SAFRONOVA, J.J. MOSCHELLA, P. WIEWIOR, V.V. SHLYAPTSEVA, M.E. WELLER, E.E. PETKOV, I.K. SHRESTHA, A. STAFFORD, M.C. COOPER, University of Nevada, Reno, NV 89557 USA — Results of Ar and Kr gas-puff experiments performed on the high-power Leopard laser at UNR are presented. The Leopard laser operated in two regimes: 350 fs, 40 TW pulse or 0.8 ns, 25 GW pulse with wavelength of 1.057 μm. A supersonic linear nozzle was compared with a cylindrical sub-sonic nozzle. Diagnostics included two sets of filtered Si-diodes, x-ray pinhole cameras, x-ray spectrometers, and PCDs. Specifically, x-ray images and structure of x-ray bursts are investigated and compared as a function of the linear or cylindrical gas jet, laser pulse duration, and target gas. Strong anisotropy with respect to laser beam polarization was observed in the x-ray output of the linear gas jet. Also, the addition of Kr to an Ar gas jet increased the intensity of the x-ray output compared to a pure Ar jet. The importance of analysis of x-ray burst features for better understanding the mechanisms of the laser energy to x-ray conversion efficiency and future research directions are discussed.

[1]The work was supported by the Defense Threat Reduction Agency, Basic Research Award # HDTRA1-13-1-0033, to University of Nevada, Reno, and in part by the DOE/NNSA Cooperative agreements DE-NA0001984 and DE-NA0002075.

Kimberly Schultz
University of Nevada, Reno

Date submitted: 09 Oct 2014 Electronic form version 1.4