Abstract Submitted
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An analysis of x-rays emitted from laser-produced noble gas jet plasmas and a comparison of gas jet nozzles[1] K.A. SCHULTZ, V.L. KANTSYREV, V.V. SHLYAPTSEVA, I.K. SHRESTHA, E.E. PETKOV, A.S. SAFRONOVA, J.J. MOSCHELLA, A. STAFFORD, M.C. COOPER, Physics Department, University of Nevada, Reno — The study of fs laser interaction with underdense gas jet plasmas is important for understanding the mechanisms of x-ray (1-20keV) emission. Clusterized gas jets produced by a linear supersonic nozzle were irradiated with a high-intensity laser pulse generated by the UNR Leopard laser (at 1-2x10^{19}W/cm^2). Jets of Ar, Kr, and Xe were studied as well as triple mixtures with different percentages of each of the noble gases. Absolute x-ray outputs of the laser-gas jet interactions measured by PCDs are presented and show a strong anisotropy of x-ray radiation with respect to laser beam polarization direction. The triple mixtures each exhibited a higher x-ray yield compared to pure gases and a factor of 10^{-3} of laser energy was converted into x-rays. Characterization of gas jets was also performed at the Radiation Physics Laboratory at UNR using interferometry and Rayleigh scattering. The combination of density and cluster measurements results in the calculation of the cluster parameter ηN_c. The characterization was performed for the linear supersonic nozzle and a new, complex conical nozzle with applications in Z-pinch and laser-produced plasma research. The linear nozzle has a larger line-integrated density.

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