

Abstract Submitted
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Renovating “Sparky” Facility to Investigate Gas-puff Z-pinches with X-ray Focusing Spectrometers¹ M.C. COOPER, V.L. KANTSYREV, A.S. SAFRONOVA, I.K. SHRESTHA, V.V. SHLYAPTSEVA, K.A. SCHULTZ, A. STAFFORD, E.E. PETKOV, M.T. SCHMIDT-PETERSEN, W. CLINE, C. DAVIDSON, Physics Department of the University of Nevada, Reno — The compact x-ray/EUV facility “Sparky” at the UNR Physics Department’s Plasma Physics and Diagnostics Laboratory (PPDL) was renovated to obtain high density and temperature plasmas with gas-puff Z-pinch experiments. The renovated facility will be used for plasma dynamics and radiation studies, benchmarking of theoretical codes, calibration of x-ray diagnostics, and training of UNR physics students. In “Sparky” vacuum spark tests, up to 110 kA with a 1-1.5 μ s rise time have been measured with the capacitor bank at 17 kV of its 25 kV capacity. A gas-puff system has been developed with pre-ionization capabilities. Interferometry and Rayleigh scattering measurements indicate a hollow shell structure in the density of the supersonic Ar gas jet. A Hamos type spectrometer using a mica crystal and a Johann type spectrometer using a Si crystal were designed for x-ray spectroscopy of “Sparky” Z-pinches. Both spectrometers were tested with the UNR Leopard sub-ps laser and recorded x-ray spectra from laser interactions with Ar and Kr gas-puff jets from supersonic nozzles.

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