Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Hydrodynamic and atomic-kinetic modelling of photoionised neon plasmas IAIN HALL, TUNAY DURMAZ, ROBERTO MANCINI, University of Nevada, Reno, JIM BAILEY, GREGORY ROCHAU, Sandia Nat. Labs., MICHAEL ROSENBURG, DAVID COHEN, Swarthmore College, IGOR GOLOVKIN, JOSEPH MACFARLANE, Prism Comp. Sciences, MANOLO SHERRILL, JOSEPH ABDALLAH, LANL, ROBERT HEETER, MARK FOORD, SIEGFRIED GLENZER, LLNL — Photoionised plasmas are common in astrophysical environments. New high resolution spectra from such sources have been recorded in recent years by the Chandra and XMM-Newton satellites. These provide a wealth of spectroscopic information and have motivated recent efforts aimed at obtaining a detailed understanding of the atomic-kinetic and radiative characteristics of photoionised plasmas. The Z-pinch facility at the Sandia lab is the most powerful terrestrial source of X-rays and provides an opportunity to produce photoionised plasmas in a well characterised radiation environment. We present modelling work and experimental design considerations for a forthcoming experiment at Sandia in which X-rays from a collapsing Z-pinch will be used to photoionise low density neon contained in a gascell. View factor calculations were used to evaluate the radiation environment at the gascell; the hydrodynamic characteristics of the gascell were examined using the Helios-CR code, in particular looking at the heating, temperature and ionisation of the neon and the absorption of radiation. Emission and absorption spectra were also computed, giving estimates of spectra likely to be observed experimentally.

Iain Hall
University of Nevada, Reno

Date submitted: 14 Feb 2008 Electronic form version 1.4