Abstract Submitted
for the FWS17 Meeting of
The American Physical Society

Spectroscopic Modeling of X-Ray Spectra for Xe High Energy Density Plasmas[1] A.K. GILL, E.E. PETKOV, A.S. SAFRONOVA, V.L. KANTSYREV, R. CHILDERS, K.A. SCHULTZ, V.V. SHLYAPTSEVA, I.K. SHRESTHA, M.C. COOPER, University of Nevada, Reno — The study of plasma is a rich field of interest with far reaching applications, e.g. understanding astrophysical phenomena, controlled fusion, and effects of radiation physics. Moreover, the use of X-ray spectroscopy is a very important tool in the study of high energy density (HED) plasmas. Particularly, M-shell radiation from Xe HED plasmas is of special theoretical interest due to the large number of ionic transitions and their overlap compared to K-shell and L-shell radiation. M-shell radiation is more complex to study and thus presents a challenge and needs an experimental benchmark. The goal of this research is to isolate M-shell Xe spectral features and identify specific peaks to learn about the properties of the Xe HED plasma created in interaction of femtosecond laser pulse with gas puff plasma using the Titan laser at Lawrence Livermore National Laboratory. Theoretical spectra are produced using the Spectroscopic Collisional-Radiative Atomic Model (SCRAM). Electron temperature and density dependences to analyze the M-shell transitions are presented for the spectral range of 9-15 Å, as well as the theoretical modeling of the experimental M-shell Xe data from the Titan laser.

[1]This work was supported by NNSA under DOE grant DE-NA0003047.

Amandeep Gill
University of Nevada, Reno

Date submitted: 05 Oct 2017 Electronic form version 1.4