

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Comparative calculations of plasma ionization balance, collisionality and resistivity using various models in application to z-pinch physics¹ ANDREY ESAULOV, University of Nevada, Reno, WALTER JOHNSON, University of Notre Dame, ALLA SAFRONOVA, ULYANA SAFRONOVA, NICK OUART, MIKE WELLER, VICTOR KANTSYREV, University of Nevada, Reno — High energy density plasmas produced by the imploding wire array loads, including single- and multi-planar wire arrays, has been extensively studied for the past few years at the University of Nevada, Reno at 1.7 MA Zebra facility. Various modeling tools such as the magnetohydrodynamic (MHD) codes and non-LTE atomic kinetic models have been applied to analyze plasma dynamics and radiation features. In this work the results of the aforementioned models are compared with the average atom model (Thomas–Fermi and Ziman approximations). The analysis is accomplished for low (Al) and moderate (Cu) atomic number elements in broad ranges of T_e and n_e . The advantage of application of such approach to the analysis of z-pinch experiments is discussed.

¹This work was supported by NNSA under DOE Cooperative Agreements DE-FC52-06NA27588 and DE-FC52-06NA27586.

Andrey Esaulov
University of Nevada, Reno

Date submitted: 08 Sep 2010

Electronic form version 1.4