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Improvements to a novel photoionized plasma experiment and calculations at the Z facility T.E. LOCKARD, D.C. MAYES, T. DURMAZ, R.C. MANCINI, University of Nevada-Reno, G. LOISEL, J.E. BAILEY, G.A. ROCHAU, Sandia National Laboratories, D.A. LIEDAHL, R.F. HEETER, Lawrence Livermore National Laboratory — A large scale effort has been made to understand and explain photoionized plasmas in astrophysical observations made by X-ray orbiting telescopes like Chandra and XMM-Newton. The atomic kinetics and radiation transfer of these plasmas are driven by a large flux of high energy photons required by the photoionization process. While these sources of high flux drivers are more abundantly found in celestial mediums, the difficulty comes into play when trying to create such a source in a controlled laboratory environment. This has been part of the crux and hindrance of the progress in studying this fundamental aspect of nature. Luckily, with recent developments and utilization of pulsed power technologies the Z machine at Sandia National Laboratory helps alleviate this obstruction. To understand the complex environment where a collapsing wire array is used to create the intense source of X-rays required to produce a photoionized plasma, a large array of geometric, radiation-hydrodynamic and atomic kinetic codes help to give insight into the X-ray environment and plasma hydrodynamics of the system. These calculations complement experimental data attained to give a more complete understanding and deepen our knowledge of the competing processes in laboratory photoionized plasmas.

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