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Photoionized Neon Plasma Experiments at Z: Data Processing and Analysis Development¹ D. MAYES, T. LOCKARD, T. DURMAZ, R. MANCINI, University of Nevada, Reno, J. BAILEY, G. ROCHAU, G. LOISEL, Sandia National Laboratories, R. HEETER, D. LIEDAHL, Lawrence Livermore National Laboratory — We discuss an experimental effort to study the atomic kinetics in photoionized plasmas via K-shell line absorption spectroscopy. The experiment employs the intense x-ray flux emitted by the collapse of a Z-pinch to heat and backlight a neon photoionized plasma contained within a cm-scale gas cell placed at various distances from the Z-pinch and filled with neon gas. High-resolution spectra show absorption by several ionization stages of neon, including Be-, Li-, He-, and H-like ions. Analysis of these spectra yields ion areal-densities and charge state distributions, which can be used to benchmark atomic kinetics codes. In addition, the electron temperature is extracted from level population ratios of Li- and Be-like ions, which can be used to test heating models of photoionized plasmas. We will also discuss improvements made to the processing and analysis methods, as well as trends that are visible in the analysis results.

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