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Spectral Line Identification in Photoionized Silicon Plasma Emission[1] PATRICIA CHO, University of Texas at Austin, GUILLAUME LOISEL, JAMES BAILEY, TAISUKE NAGAYAMA, STEPHANIE HANSEN, Sandia National Laboratories, MICHAEL MONTGOMERY, DON WINGET, University of Texas at Austin, WCAPP TEAM — Photoionized silicon experiments were performed using the Z machine at Sandia National Laboratories. These data represent the first benchmark emission spectra suitable to test the theoretical assumptions in astrophysical models of accretion-powered photoionized plasmas. Additionally, a high spectral resolution ($\lambda/\delta\lambda$˜9200) spectrometer was conceived to record that emission. This instrument yielded unprecedented resolution for plasma emission with detections of spectral lines unobserved previously. The combination of a low-density plasma, the highly resolving quartz crystal, the minimum source size effect in the spherical geometry and the highly resolving x-ray film, all made these high-spectrally-resolved observations possible. These data allow for measurements of relative wavelengths for these lines which can be used to test model predictions for multiple silicon charge (He-like to B-like) and level states within charge states. We discuss how the results could be used to expand line databases with constrained uncertainties.

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