

Abstract Submitted
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Electron density determination in a MgFe dense plasma via Stark-broadening analysis¹ ROBERTO MANCINI, University of Nevada, Reno, JAMES BAILEY, GREGORY ROCHAU, PATRICK LAKE, Sandia National Laboratories, CARLOS IGLESIAS, Lawrence Livermore National Laboratory, JOSEPH ABDALLAH, Los Alamos National Laboratory, JOSEPH MACFARLANE, IGOR GOLOVKIN, PING WANG, Prism Computational Sciences — Recent measurements of L-shell Fe opacity at temperatures above 100eV were performed at Sandia National Laboratories by recording x-ray transmission through a MgFe two-element plasma. While the observation of line absorption in Fe L-shell transitions was an important goal of the experiment, the Stark-broadened line absorption in Mg K-shell transitions provided an independent spectral signature for electron density determination. Indeed, at the expected 10^{21} cm⁻³ to 10^{22} cm⁻³ electron density range, Stark-broadening dominates the line width of several Mg K-shell transitions. We discuss the Mg K-shell line absorption spectrum, the calculation of Stark-broadened absorption line shapes, and their application to data analysis and electron density extraction.

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