

# Magnetic Field Sensitive Line Ratios in EUV and X-ray Spectra

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## Abstract

While performing detailed laboratory measurements aimed at cataloguing the L-shell line emission of astrophysically abundant ions in the extreme ultraviolet and X-ray bands we discovered a class of lines that are sensitive to the strength of the ambient magnetic field. We have identified one such line in S VII and one in Ar IX. Currently we are performing measurements to identify the corresponding line in Fe XVII. The intensity of the line increases as the magnetic field strength increases. As a result, the ratio of the intensity of this line to those of neighboring lines that are not sensitive to the magnetic field represents a diagnostic of the magnetic field strength. Calculations show that the magnitude of field strengths that can be measured with this line ratio ranges from a few hundred gauss to several tens of kilogauss depending on the particular ion emitting the line.

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