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Measuring Ion Impurities using EUV Spectroscopy on LTX¹ GRANT BODNER, UW-Madison, DENNIS BOYLE, ROBERT KAITA, PPPL, PETER BEIERSDORFER, LLNL — The Lithium Tokamak eXperiment is a small low-aspect ratio spherical tokamak that investigates the relationship of lithium (Li) wall coatings and plasma-facing components (PFCs). Plasmas produced by tokamaks such as LTX possess similar characteristics to astrophysical plasma phenomena, most notably the stellar flares of the solar corona. Impurities in LTX can emit radiation in the extreme-ultraviolet (EUV) regime with similar spectra seen in these astrophysical plasmas. The Long-Wavelength Extreme Ultraviolet Spectrometer (LoWEUS) was recently added to LTX, to identify ion emission in the 60-400 Å range. LoWEUS is a flat-field grazing-incidence spectrometer that uses a grating with variable line spacing in order to diffract the incident EUV radiation into its respective spectral lines. The EUV spectra collected by LoWEUS can be used to measure both the ion impurity content in LTX as well as to calibrate atomic models used to analyze ion emission from stellar spectra.

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