

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

New R -matrix calculations of neutral W electron-impact excitation and ionization for PFC erosion diagnostics¹ S.D. LOCH, D.A. ENNIS, M.S. PINDZOLA, C.A. JOHNSON, AUBURN UNIVERSITY, C.P. BALLANCE, QUEEN'S UNIVERSITY BELFAST, T. ABRAMS, ORAU, E. UNTERBERG, ORNL — The erosion rate of tungsten PFCs can be diagnosed spectroscopically using spectral line intensity measurements combined with a set of ionization per photon coefficients (also called S/XB ratios). The accuracy of this diagnostic technique depends critically upon the quality of the atomic data comprising the S/XB ratio. This project aims to improve the accuracy of W excitation and ionization atomic data using non-perturbative methods. Synthetic spectra generated from existing perturbative W data are used to guide the size of the new R -matrix calculations. The new data is used to generate a synthetic spectrum, which is compared with measured DIII-D ultraviolet spectra to determine the optimal lines for diagnosing W erosion. The new ionization rate coefficients are compared with literature values. The new S/XB ratio for the 400.9 nm line is compared with measured values and the density, temperature and metastable dependence of the S/XB ratios for new UV lines are investigated.

¹Work supported by USDOE grant DE-SC0015877.

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Date submitted: 15 Jul 2016

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