

Abstract Submitted
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The role of neutral W metastable states in tungsten spectral line emission and erosion diagnostics.¹ SD LOCH, MS PINDZOLA, CA JOHNSON, C FAVREAU, DA ENNIS, Auburn University, R SMYTH, M TURKINGTON, CP BALLANCE, Queen's University of Belfast — W I spectral emission has been widely used to measure influx rates from W PFCs via S/XB coefficients. These coefficients depend upon calculated W I photon emissivities and effective ionization rate coefficients, each of which can be influenced by long lived metastable states. A review of progress in new atomic calculations for W excitation and ionization is given, along with a description of the remaining challenges. The new data is used to investigate the sensitivity of W I emission and ionization to metastable populations. The metastable-resolved data is generated using a collisional-radiative model. A comparison with W I measured spectra from DIII-D and Auburn CTH plasmas are given. Each spectral line can be associated with a single driving metastable population, simplifying the modeling considerably and giving a potential metastable diagnostic. New atomic coefficients are also generated for use in ERO modeling and compared with previously used data.

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