

# ELECTRON IMPACT IONIZATION, RECOMBINATION, AND PHOTON EMISSIVITY COEFFICIENTS FOR TUNGSTEN IONS

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Tungsten (W) is a highly preferred plasma facing component in various fusion tokamaks as well as ITER and atomic data need on W for spectroscopic and transport modelings in fusion plasma has been increased. We have calculated electron impact ionization [1] and dielectronic recombination (DR) cross sections [2], and photon emissivity coefficients (PEC) for W ions using Flexible Atomic Code (FAC). We have also compiled and evaluated DR data for W ions through an IAEA consultants meeting.

Our calculated PEC's for  $W^{q+}$  ( $q=5-48$ ) have been used in a spectroscopic modeling combined with an impurity transport modeling and the modeled spectra has been compared with the spectra measured from a W power injection experiment in KSTAR tokamak and with the modeled spectra using the Atomic Data and Analysis Structure (ADAS) PEC's. Figure 1 shows the measured and modeled spectra. The newly recommended data on DR for W ions will be also used in the spectroscopic and transport modeling and the sensitivity of the modeled spectra to the DR data will be discussed.

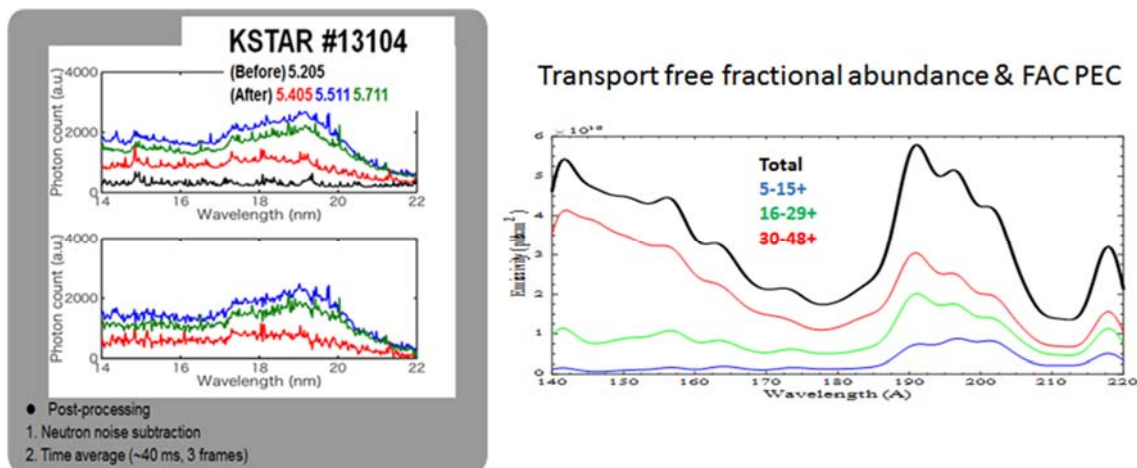


Figure 1: VUV spectra measured in KSTAR tokamak and modeled spectra using our PEC data for  $W^{q+}$  ( $q=5-48$ ) and a fractional abundance in collisional ionization equilibrium.

## References

- [1] D.-H. Kwon et al., Int. J. Mass Spectrometry 356, 7 (2013); D.-H Zhang and D.-H. Kwon, J. Phys. B 47, 075202 (2014).
- [2] D.-H. Kwon and W. Lee, J. Quant. Spectrosc. Radiat. Transfer 179, 98 (2016); *ibid.*, 170, 182 (2016).