

Measurement and modeling of tungsten sources in WEST

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WEST is the first superconducting tokamak to have begun operations with all tungsten (W) plasma-facing components (PFCs) [1]. To fully benefit from the opportunity to study W sources in this all W environment, including the relative contributions from divertor and wall regions, as well as synergy between them, dedicated experimental sessions are planned for the upcoming campaigns. In anticipation of these dedicated pulses, relevant measurement and modeling capabilities are discussed, together with the experimental plan.

For source characterization, all regions of interest are accessible by means of *in vessel* periscopic optics and optical fiber assemblies, thus overcoming the direct access limitations imposed by the cryostat [2]. Two spectrally resolving instruments are supplemented by an ORNL Filterscope [3] system, to resolve sources at ELM-relevant timescales. This is necessary, as intra-ELM sources can have a different dependence on plasma parameters than inter-ELM sources [4], thus also potentially affecting the relative weight between divertor and wall sources in ELMing H-mode discharges. All optics and instruments are optimized for transmission and detection at and near the W I line at 400.9nm, while the Filterscope also includes continuum emission monitoring from a (line free) region spectrally offset from the W I line, to correct for bremsstrahlung or blackbody radiation. D_{α} is simultaneously detected. Spectral filtering is optimized to avoid the parasitic lines from e.g. diagnostic argon injections. Early spectra and Filterscope commissioning data will be shown and discussed.

Progress in the simulation of W sources from WEST will be also discussed in the context of interpretation of the spectroscopic data. Earlier studies had revealed the divertor baffle to be a potentially significant source region outside the divertor targets [5]. Refinements in these calculations, including the effect of impurities will be presented. Longer term plans, including long-pulse W migration studies will also be briefly discussed in the context of measurement and modeling capabilities. [1] J. Bucalossi et al., *Fusion Eng. Des.* **86** (2011) 684; [2] O. Meyer et al., *RSI* **87**, 11E309 (2016); [3] E.A. Unterberg et al., *RSI* **83**, 10D722 (2012); [4] N. Den Harder et al., *NF* **56**, 026014 (2016); [5] M. Marandet, *JNM* **463**, p. 629, 2015)

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