Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Refinement of the two-filter radiometric method for determining gross W erosion in the WEST tokamak[1] D.C. EASLEY, University of Tennessee, Knoxville (UTK), A.L. NEFF, C.C. KLEPPER, E.A. UNTERBERG, ORNL, D.C. DONOVAN, UTK, WEST TEAM — The validity of a low Ar intensity assumption in a two-filter radiometer with a W-I filter design is examined using experimental data collected during the 2018-2019 WEST campaigns. Accurate measurements of the gross W sputtering rate are essential to understanding the magnitude and location of scrape-off layer contamination due to PMI effects. Hence, a two-filter radiometric technique is used for cross-calibrating W line-emission spectroscopy throughout WEST. Here, a line filter from 399.9 to 401.2 nm was used to isolate the 400.9 nm W-I emission line. Moreover, a 401.45 nm Ar-II peak was known to lie just outside the bound of this main filter during the design and to have negligible parasitic contribution to the W-I signal because it was considered sufficiently attenuated by the main W-I filter. Recently however, it has been shown that the Ar-II peak can contribute to the W-I signal. Here, the validity of the assumptions used in this two-filter radiometric technique are reassessed by characterizing regimes of W/Ar line intensity ratios with standard spectroscopy. We also reassess the integration technique used for spectroscopic line fitting and compare this with the radiometric data of neighboring sightlines to validate the two-filter technique for any W/Ar ratio, providing a potential figure of merit for using the radiometers.

[1]Work supported by the US DOE under DE-AC05- 00OR22725 and DE- SC0020414 with UT-Battelle; WEST http://west.cea.fr/WESTteam.

Davis Easley
University of Tennessee, Knoxville

Date submitted: 29 Jun 2020 Electronic form version 1.4