Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Improved Forward Modeling of Impurity Transport With Integration of STRAHL and EMC3-EIRENE COLIN SWEE, University of Wisconsin - Madison, THOMAS WEGNER, Max Planck Institute for Plasma Physics, FERNANDO CASTILLO, HEINKE FRERICHS, BENEDIKT GEIGER, University of Wisconsin - Madison — Understanding of impurity transport properties in fusion plasmas is important since accumulation of heavy impurities can lead to radiation losses and thus,degradation of plasma conditions. One common method for studying impurity transport utilizes the controlled injection of impurities using laser ablation. Upon injection, these impurities emit characteristic line radiation in the UV and X-Ray spectra. Measured emissivities are then compared with synthetic data from modeling tools such as the 1D impurity transport code, STRAHL. However, when using the currently utilized codes, complications arise when trying to consider stellarators featuring complicated 3D eld structures. Particularly, the scrape-o-layer, often featuring island structures and open eld lines, cannot be modeled by a 1D code. Thus, improved forward modeling requires more careful consideration in the SOL region. This work describes the initial results from a combination of STRAHL with the 3D transport code EMC3-Eirene. EMC3-Eirene provides the analysis with information on the SOL impurity transport and neutral density, while also providing self consistent proles for the electron and ion temperatures. The impact of coupling these two codes is presented for selected HSX and W7X experiments.

Colin Swee
University of Wisconsin - Madison

Date submitted: 01 Jul 2020 Electronic form version 1.4