Contribution ID: **1162** Type: **not specified**

P3.115 Tungsten sources and transport during Metal Rings Campaign in DIII-D*

Wednesday, 19 September 2018 11:00 (2 hours)

The Metal Rings Campaign in DIII-D allowed for studies of tungsten sourcing and transport from poloidally localized, isotopically distinct surfaces in a low-Z background. Two 5 cm wide toroidal rings of W-coated tile inserts were installed in the lower divertor of DIII-D. The outboard (shelf) ring was coated with isotopically enriched W-182; the inboard (floor) ring used a natural W coating. Two types of collector probes were used in the divertor and near outboard mid-plane to study short- and long-range transport of W. The divertor probe installed on DiMES manipulator was located 1 cm radially outboard of the shelf ring. The mid-plane collector probe was inserted in the scrape-off layer (SOL) plasmas. In reproducible L-mode plasma discharges with Outer Strike Point (OSP) on the shelf ring, a low near-surface steady-state W coverage formed on the part of the divertor probe undergoing net erosion, while in the region of net C deposition W kept accumulating with time in the deposits. In the same experiment, measured deposition of W on the mid-plane collector probes showed more W collected on the side facing away from the lower divertor, which was explained by OEDGE modelling suggesting W accumulation at the plasma crown, driven by ion temperature parallel gradient force. In another experiment with ELMy H-mode discharges, the OSP was positioned on the floor ring while the shelf ring was in SOL. Isotopic analysis of W collected by mid-plane probes showed that for discharges with smaller frequent ELMs the floor W source was dominant, while with larger, less frequent ELMs the floor and shelf sources were comparable. Arcing observed on the shelf ring via fast filtered imaging may be also a significant contributor to the SOL W source during large ELMs.

*Work supported in part by the US DOE under DE-FG02-07ER54917, DE-FC02-04ER54698, DE-AC05-00OR22725, DE-NA0003525, DE-AC52-07NA27344

Presenter: RUDAKOV, Dmitry (Center for Energy Research University of California San Diego)

Session Classification: P3