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Deposition Profile Analysis from DIII-D Metal Rings Campaign Outer-Midplane Collector Probe Diagnostic and Utilization of Enriched Isotopic Tungsten Tracer Particles¹ D.C. DONOVAN, J. DURAN, S. ZAMPERINI, S. LEE, (UTK), E.A. UNTERBERG, (ORNL), W.R. WAMPLER, (SNL), D.L. RUDAKOV, (UCSD), D. ELDER, P.C. STANGEBY, (UTIAS), T. ABRAMS, (GA) — The DIII-D Metal Rings Campaign used isotopically-enriched, W-coated divertor tiles coupled with dual-facing midplane collector probes (CPs) in the far Scrape-off Layer (SOL). Inductively Coupled Plasma Mass Spectroscopy (ICP-MS) results are presented characterizing the isotopic ratios of deposited W on the CPs and which give quantitative information on the transport of W from specific poloidal locations within the lower outer divertor region having different isotopically-marked tiles. Rutherford Backscattering Spectrometry (RBS) of these CPs has provided areal densities of elemental W content. These resultant W deposition profiles were compared with DIVIMP modelling of the far-SOL to better understand impurity transport in the edge plasma. CPs were exposed for 37 distinct operating configurations (L-mode/H-mode, forward/reverse Bt, strikepoint position). Radial decay lengths (RDL) between 5 and 50 mm were observed with consistently narrower RDL and higher peak W content on the side of the probes connected along field lines to the inner divertor, indicating a concentration of W in the upstream plasma. Correlations are discussed between peak W content, RDL, and isotopic profiles on the CPs over a wide range of conditions.

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