

Abstract Submitted  
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**Assessing Scrape-Off Layer Impurity Content using Isotopic Methane ( $^{13}\text{CH}_4$ ) Tracer Experiments and Collector Probes at DIII-D<sup>1</sup>** JONAH DURAN, JAKE NICHOLS, SHAWN ZAMPERINI, UTK, EZEKIAL UNTERBERG, ORNL, DMITRY RUDAKOV, UCSD, DAVID DONOVAN, UTK — Recent experiments at DIII-D have enabled the development of an upper single null plasma shape and a non-perturbative methane ( $\text{CH}_4$ ) injection flow rate (10 T-L/s) through the upper outer baffle for isotopically tagged  $^{13}\text{CH}_4$  tracer experiments. With an elongated plasma, the ‘crown’ is brought in close proximity to the DiMES station where samples for obtaining deposition profiles can be placed. During these experiments, Langmuir probe measurements have been used to assess heat flux in order to prepare for the insertion of impurity collector probes (CPs). In addition, a new design for the large diameter MiMES CPs, refined from those used in the 2016 Metal Rings Campaign, is presented. A wider collection face and a sampling length of approximately 4 m on either side of the insertion location allows for higher fidelity evaluation of the C content in the far scrape-off-layer. Laser ablation mass spectroscopy analysis of DIII-D graphite samples from previous  $^{13}\text{CH}_4$  experiments will be presented demonstrating the high sensitivity ( $>\text{ppm}$ ) of distinguishing  $^{13}\text{C}$  deposition. Data collected during these experiments is being used to compare with impurity transport modelling to enhance the predictive capabilities through a multi-reservoir impurity particle balance and codes such as OEDGE.

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