Abstract Submitted for the DPP16 Meeting of The American Physical Society

Overview of the DIII-D Divertor Tungsten Rings Campaign<sup>1</sup> E.A. UNTERBERG, ORNL, D.M. THOMAS, T.W. PETRIE, T. ABRAMS, A.M. GAROFALO, GA, P.C. STANGEBY, U. Toronto, D.L. RUDAKOV, UCSD, O. SCHMITZ, U. Wisc., B.A. GRIERSON, PPPL, B. VICTOR, LLNL — Experiments have recently been carried out with toroidal arrays of W-coated metal inserts at two distinct locations in the lower divertor region. The purpose of the experiments is to determine the high-Z divertor erosion and migration, and its effect on core contamination in high performance, ELM-y H-mode, tokamak discharges in a mixed-material, i.e. C and W, environment. The experiments focused on characterizing the sputtering source from each location, the SOL transport of W, and the subsequent impact on core performance. A wide range of ELM-y conditions was studied, including ELM controlled and ELM-free regimes, to determine the importance of the divertor strike point position relative to W sources in these various regimes. The W penetration efficiency was characterized by using a far-SOL collector probe related to core W density. Correlations between source strength (as measured by W-I spectroscopy) relative to the distance of the strikepoint to each W array, the divertor target magnetic flux expansion, and ELM frequency was seen. These experiments aid in understanding the impact of high-Z divertor source location on core performance in future mixed-material fusion devices, e.g. ITER.

<sup>1</sup>Supported by US DOE under DE- AC05-00OR22725, DE-FC02-04ER54698, DE-FG02-07ER54917, DE-SC0013911, DE-AC02-09CH11466, DE-AC52-07NA27344.

E.A. Unterberg Oak Ridge National Laboratory

Date submitted: 14 Jul 2016

Electronic form version 1.4