Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

RMP effects on the W and C erosion/deposition balance on W test samples in DIII-D[1] E.T. HINSON, H. FRERICHS , O. SCHMITZ, UW-Madison, T.E. EVANS, H.Y. GUO, D.M. THOMAS, GA, D.L. RUDAKOV, UCSD, T. ABRAMS, ORAU, E.A. UNTERBERG, A. BRIESEMEISTER, ORNL, C.J. LASNIER, A.G. MCLEAN, M. MAKOWSKI, LLNL, W.R. WAMPLER, J.G. WATKINS, H.Q. WANG, SNL — Clear evidence for alteration of the W and C erosion by resonant magnetic perturbation (RMP) fields has been obtained in an experiment exposing W-coated DiMES samples in the DIII-D divertor to outer strike point (OSP) sweeps in comparable series of discharges with and without the application of RMP. Gross erosion measurements of W and C during these sweeps using the S/XB method show that the 3-D boundary induced by the RMP significantly alters the erosion rate from DiMES. In particular, application of RMP smooths radial W erosion anisotropy seen for the axisymmetric case, where the W erosion rate for the OSP sweep in the outward direction significantly exceeds the erosion rate observed for the subsequent inward radial sweep over the sample. This finding is likely related to a change in the W/C erosion and redeposition balance in the C-dominated wall environment at DIII-D. Moreover, non-axisymmetric plasma structure on the W sample has to be considered. This challenge will be further examined by comparison of experimental results to EMC3-EIRENE modeling.

[1]Work supported by US DOE DE-SC0013911, DE-FC02-04ER54698, DE-FH02-07ER54917, DE-AC05-06OR23100, DE-AC05-00OR22725, DE-AC52-07NA27344, and DE-AC04-94AL85000.

E.T. Hinson
UW-Madison

Date submitted: 13 Jul 2016 Electronic form version 1.4