

Abstract Submitted
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Modeling of material erosion and redeposition for dedicated DiMES experiments on DIII-D¹ R. DING, T. ABRAMS, C.P. CHROBAK, H.Y. GUO, P.B. SNYDER, GA, V.S. CHAN, GA/VSC, D.L. RUDAKOV, UCSD, P.C. STANGEBY, J.D. ELDER, UTIAS, D. TSKHAKAYA, UWIEN, W.R. WAMPLER, SNL, A. KIRSCHNER, FZJ, A.G. MCLEAN, LLNL — Erosion and redeposition of plasma facing materials is a key issue for high-power, long pulse tokamak operation. A series of experiments has been carried out on DIII-D in which well-characterized samples of different materials were exposed to divertor plasma using DiMES. Such experiments provide a good benchmark for PMI codes, such as ERO. It was found that the erosion and redeposition are strongly determined by the impurity content in the plasma and sheath properties near the surface. The principal experimental results (net erosion rate and profile, net/gross erosion ratio) are reproduced by ERO simulations to within the uncertainties, indicating that the controlling physics has likely been identified. New techniques suggested by modeling such as external biasing and local gas injection for suppressing material erosion are planned to be tested in DiMES/DIII-D experiments.

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