Abstract Submitted for the 50th Annual Meeting
Division of Plasma Physics
November 17–21, 2008, Dallas, Texas

Category Number and Subject:

[ ] Theory [X] Experiment

Direct Measurements of Chemical Sputtering Yield and Photon Efficiencies in the DIII-D Divertor,* A.G. McLean, P.C. Stangeby, Y. Mu, J.W. Davis, A.A. Haasz *(U. Toronto),* S.L. Allen, M.E. Fenstermacher, M. Groth, C.J. Lasnier *(LLNL),* B.D. Bray, N.H. Brooks, T.H. Osborne, T.W. Petrie, W.P. West, C.P.C. Wong *(GA),* D.G. Whyte *(MIT),* J.A. Boedo, D.L. Rudakov *(UCSD),* R.E. Isler *(ORNL),* J.G. Watkins *(SNL),* S. Brezinsek, M. Jakubowski *(FZ Jülich)* — The intrinsic chemical erosion yield near the outer strike point has been measured *in-situ* in DIII-D to be ~2.6% in attached divertor plasma and ~1.7% in semi-detached divertor plasma. These values are close to theoretical predictions and lab experiments. In fully detached conditions, as will occur at the ITER targets, near total extinction of the CH band occurred which is not predicted or included in current ITER modeling. Measurements were made with an artificial methane injection rate nearly equal to the expected intrinsic chemical erosion rate. Photon efficiencies for CH, CII and C_2 dimer from the breakup of injected CH_4 yielded significantly lower values than previous results at higher puff rates, underscoring the importance of minimizing perturbation to the local plasma.

*Work supported in part by the US DOE under DE-AC52-07NA27344, DE-FC02-04ER54698, DE-FG02-07ER54917, DE-AC05-00OR22725, DE-AC04-94AL85000.