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Category Number and Subject: 562 (DIII-D Tokamak)

[ ] Theory    [X] Experiment

Effect of the Surface Temperature on Net Carbon Deposition and Deuterium Co-deposition in DIII-D Divertor,*
D.L. Rudakov, J.A. Boedo, R.A. Moyer, UCSD, R. Bastasz, W. Wampler, J.G. Watkins, SNL, J. Brooks, ANL, N.H. Brooks, W.P. West, C.P.C. Wong, GA, W. Jacob, K. Krieger, IPP Garching, A. Litnovsky, V. Philipps, IPP Juelich, A.G. McLean, P.C. Stangeby, UToronto – We report a strong effect of a moderately elevated surface temperature on net C deposition and D co-deposition in DIII-D divertor under detached conditions. A DiMES sample with a gap 2 mm wide and 15 mm deep was exposed to L-mode plasmas first at room temperature then at 200°C. At the elevated temperature deuterium co-deposition in the gap was reduced an order of magnitude and net carbon erosion at a rate of 3 nm/s was measured at the plasma-facing surface of the sample. In another experiment visible deposits were produced on molybdenum mirrors recessed 2 cm under the divertor floor and exposed to ELMing H-mode plasmas for 25 seconds at room temperature. In contrast, virtually no deposits were observed on mirrors exposed to similar plasmas for 70 seconds at elevated temperatures, between 140 and 80°C.

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