Abstract Submitted for the DPP05 Meeting of The American Physical Society

Migration of Micron Size Carbon Dust in the DIII-D Divertor¹ C.P.C. WONG, N.H. BROOKS, T.E. EVANS, A.W. HYATT, W.P. WEST, GA, D.L. RUDAKOV, G. ANTAR, J.A. BOEDO, E.M. HOLLMANN, S.I. KRASHENINNIKOV, R.A. MOYER, A. PIGAROV, UCSD, M.E. FENSTERMA-CHER, M. GROTH, C.J. LASNIER, LLNL, R. MAINGI, ORNL, A.G. MCLEAN, U. Toronto, W.M. SOLOMON, PPPL — We studied migration of pre-characterized carbon dust in a tokamak environment by introducing about 30 mg of micron-size dust flakes (5-10 μ m in diameter) in the lower divertor of DIII-D using the DiMES sample holder. In two separate experiments dust was exposed to strikepoint sweeps of high power lower-single-null discharges in an ELMing H-mode regime. When the outer strike point passed over the dust holder, 1-2\% of the total dust carbon content (equivalent to a few million of dust particles) penetrated the plasma core, raising the core carbon density by a factor of 2-3. Individual dust particles were observed moving at velocities of 10-100 m/s, predominantly in the toroidal direction consistent with the ion drag force. The observed behavior of the dust is in qualitative agreement with modeling by the DustT code.

¹Supported by US DOE under DE-FC02-04ER54698, DE-FG02-04ER54758, W-7405-ENG-48, DE-AC05-00OR22725, and DE-AC02-76CH03073.

T.S. Taylor General Atomics

Date submitted: 21 Jul 2005 Electronic form version 1.4