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Observation of Carbon Dust in the DIII-D Divertor and SOL* D.L. Rudakov, A.Yu. Pigarov, R.D. Smirnov, J. Yu, *UCSD*, W.P. West, C.P.C. Wong *GA*, M. Groth, M.E. Fenstermacher, *LLNL*, W.M. Solomon, *PPPL* – Dust accumulation is a serious safety concern for ITER. In DIII-D carbon dust is observed in divertor and scrape-off layer (SOL) by optical imaging. After an extended entry vent, thousands of dust particles are observed in the first 2-3 plasma discharges. Individual particles moving at velocities up to ~500 m/s, and breakup of larger particles into pieces are observed. After ~70 discharges, dust levels are reduced to a few observed events per discharge except in discharges with disruptions that produce significant amounts of dust. Using the divertor materials evaluation system (DiMES), micron-sized carbon dust is injected into DIII-D ELMing H-mode discharges. When the outer divertor strikepoint is swept onto DiMES, ~2% of the dust carbon content penetrates the core, raising the core carbon density by a factor of ~4. Dust particles from the injection are observed in the outboard SOL. The observed dust trajectories and velocities are in qualitative agreement with the modeling of the 3D DustT code.

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