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Category Number and Subject: 5.6.2 DIII-D Tokamak

[ ] Theory [x] Experiment

Carbon transport studies in the edge and divertor of DIII-D.* P.C. Stangeby, A.G. McLean, J.D. Elder, S. Lisgo, *U. Toronto,* S.L. Allen, M.E. Fenstermacher, M. Groth, *LLNL*, B.D. Bray, N.H. Brooks, W.P. West, *GA,* D.L. Rudakov, J.A. Boedo, *UCSD*, D.G. Whyte, *U. Wisc.*, J.G. Watkins, *SNL* – Tritium retention in divertor tokamaks appears to be governed by fast parallel flow in the SOL, conveying wall-released carbon to the inner divertor where H/D/T co-deposits build up. CH^{4-} was injected toroidally-symmetrically at the top of lower single-null discharges in DIII-D. The toroidal symmetry greatly facilitated diagnosis and modeling, while minimizing the disturbance to local plasma conditions. The CII and CIII emissions were recorded by toroidally-viewing cameras and absolutely-calibrated, poloidal-array filterscopes. The 2D reconstructed camera images provided direct evidence of fast SOL flow toward the inside. Quantitative interpretation using DIVIMP code modeling indicated $M_{||SOL} \sim 0.4$ and $D_\perp \sim 0.3\ m^2/s$. Code modeling of the injection-induced increment to the core C-ion content, as measured by CER spectroscopy, confirmed the $M_{||SOL}$ and $D_\perp$ values.

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