

**Abstract Submitted for the Forty-Sixth Annual Meeting
Division of Plasma Physics
November 15–19, Savannah, Georgia**

Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory Experiment

Carbon Source Studies in DIII-D,* J.D. Elder, P.C. Stangeby, S. Lisgo, *U. Toronto*, D.G. Whyte, *U. Wisc*, J.G. Watkins, *SNL*, B.D. Bray, N.H. Brooks, W.P. West, *GA*, S.L. Allen, M.E. Fenstermacher, M. Groth, *LLNL* – Simple as Possible Plasma (SAPP) discharges provide a good environment for investigating the source and transport of carbon impurities. The detailed diagnostic data from repeated identical, L-mode, LSN discharges makes it possible to determine a reliable plasma background through ‘empirical reconstruction’ OEDGE code modeling. DIVIMP impurity code analysis of the carbon behavior is then carried out on this plasma background. This study examines the sources of the carbon required to reproduce the experimental measurements of the CI, CII and CIII emission in the outer divertor. For attached SAPP discharges, physical sputtering of the target is sufficient to account for the observed C emission. In detached SAPP discharges, recombination of higher charge state carbon from non-local sources is required to account for the observed emission. Possible sources for the non-local carbon are considered.

*Supported by U.S. DOE under DE-FG03-96ER54373, DE-AC04-94AL85000, DE-FC02-04ER54698, W-7405-ENG-48, and NSERC, Canada.