

**Abstract Submitted for the Forty-Eighth Annual Meeting  
Division of Plasma Physics  
October 30<sup>th</sup>-November 3, 2006, Philadelphia, Pennsylvania**

Category Number and Subject: 5.4.0 Divertors, edge physics, and  
fueling

Theory     Experiment

**An Upgraded Porous Plug Injection System for Studies of Hydrocarbon Dissociation and Transport in DIII-D\*** A.G. McLean, J.W. Davis, P.C. Stangeby, A.A. Haasz, *U. Toronto*, S.L. Allen, R. Ellis, M.E. Fenstermacher, M. Groth, *LLNL*, B.D. Bray, N.H. Brooks, W.P. West, C.P.C. Wong, *GA*, D.G. Whyte, *U. Wisc.*, D.L. Rudakov, *UCSD*, J.G. Watkins, *SNL*, S. Brezinsek, *Jülich* – The objective of the Porous Plug Injector (PPI) is to obtain calibrated spectroscopic measurements of dissociation fragments resulting from hydrocarbon influx in a tokamak divertor. This is done by admitting methane through a porous surface, >90% graphite, such that the injected molecules “see” a local carbon surface, similar to the re-deposition environment seen by molecules emitted by chemical sputtering. Following its initial use in DIII-D DiMES, the PPI has been significantly upgraded to include a finer porous graphite cap, a small orifice flow restrictor for precise gas control, and a built-in Langmuir probe to make direct measurement of possible perturbation to the local plasma as a consequence of gas injection. Design of these and other improvements are presented.

\*Work supported by US DOE under DE-FC02-04ER54698, W-7405-ENG-48, DE-FG02-04ER54762, DE-FG02-04ER54758, and DE-AC04-94AL85000.