Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Experiments With a 6-Valve Array for Massive Gas Injection for Disruption Mitigation in DIII-D[1] T.C. JERNIGAN, L.R. BAYLOR, S.K. COMBS, ORNL, E.M. HOLLMANN, J.A. BOEDO, R.A. MOYER, D.L. RUDAKOV, J.H. YU, UCSD, T.E. EVANS, D.A. HUMPHREYS, P.B. PARKS, E.J. STRAIT, J.C. WESLEY, M.A. VAN ZEELAND, W.P. WEST, GA, D.G. WHYTE, MIT, M. BAKHTIARI, FIT — A 6-valve array was installed on the DIII-D to test massive gas injection for suppression of runaway electrons during disruptions. Previous experiments were limited by the peak flow rate from a single valve. Initial experiments show somewhat improved electron assimilation before the core thermal quench (TQ). Peak core mixing efficiencies of impurities injected into the vacuum vessel through the TQ are ∼10%-40%. Tests using up to 5 valves were done in H_2, He, and 98% H_2-2% Ar. These experiments injected as much gas before the TQ as previously obtained during the entire TQ/I_p decay. They also showed the importance of maintaining the gas flow during the I_p decay to maintain the density. Densities of up to 2x10^{21} m^{-3} were obtained (∼10% of the Rosenbluth density for runaway suppression), but it was still increasing with added valves.

[1]Supported by the US DOE under DE-AC05-00OR22725, DE-FG02-04ER54758, DE-FC02-04ER54698, and DE-FG02-04ER54762.

T.C. Jernigan
ORNL

Date submitted: 24 Jul 2007 Electronic form version 1.4