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Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment

Experiments With a 6-Valve Array for Massive Gas Injection for Disruption Mitigation in DIII-D,* 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.

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