Abstract Submitted
for the DPP97 Meeting of
The American Physical Society

Sorting Category: 5.1.1.2 (experimental)

Behavior of Double-Null H–mode Discharges at High Density in DIII–D[1] T.W. PETRIE, A.W. LEONARD, M.A. MAHDAVI, W.P. WEST, GA, R. MAINGI, ORNL, S.L. ALLEN, M.E. FENSTERMACHER, D.N. HILL, C.J. LASNIER, G.D. PORTER, LLNL, and the DIII–D Team — There are important differences in the high density behavior of single-null (SN) and magnetically-balanced double-null (DN) divertors under ELMing H–mode conditions. For example, no clear divertor MARFEs have thus far been detected in DN discharges, even at densities approaching the Greenwald density limit ($\bar{n}_{e,G}$). This contrasts with high density SN cases, where divertor MARFEs have formed with $\bar{n}_e/\bar{n}_{e,G}$ as low as $\sim$0.6. Overall, the high X–point DN divertors have been able to maintain good confinement ($\tau_E/\tau_E^{89} \sim 1.6$, where τ_E^{89} is ITER-89 L–mode scaling) at high line-averaged density ($\bar{n}_e/\bar{n}_{e,G} \sim 0.95$). Reduced MARFE activity in DN divertors at high density may be due to two factors: reduced connection length between strike points of the outer separatrix field lines, and a more evenly distributed D_2 recycling (vis-a-vis SN). Other factors also affect high density DN performance: X–point location and gas puff rate. UEDGE analysis of these DN high density shots will be presented.

[1]Supported by U.S. DOE Contracts DE-AC03-89ER51114, W-7405-ENG-48, DE-AC05-96OR22464.

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Date submitted: July 8, 1997 Electronic form version 1.2