Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Effect of divertor closure and impurities on detachment onset in DIII-D[1] A.L. MOSER, A.W. LEONARD, R.J. GROEBNER, T.W. PETRIE, C.F. SANG, H. WANG, GA, S.L. ALLEN, A.G. MCLEAN, M.E. FENSTERMACHER, C.J. LASNIER, M. MAKOWSKI, LLNL, J.G. WATKINS, SNL, A.R. BRIESEMEISTER, ORNL — Heat flux control in future devices requires a detached divertor with upstream parameters compatible with core performance, e.g., at a lower upstream density than presently achievable. Comparison between matched H-mode discharges in the upper and lower divertors of DIII-D demonstrates onset of detachment at a reduced pedestal density for the more-closed geometry of the upper divertor. The upper divertor also produces a lower pedestal density with a less-steep profile than the lower divertor for matched discharges with no additional fueling, presumably due to a reduction in ionization source for the upper divertor. Recent experiments further compare the upper and lower divertors with the addition of impurities injected into the private flux region. These experiments measure the interplay between increased closure and radiating impurities and the effect on divertor detachment, as well as the ability of the more-closed divertor geometry to prevent the accumulation of impurities in the core.

[1]Work supported by US DOE under DE-FC02-04ER54698, DE-AC52-07NA27344, DE-AC04-94AL85000, DE-AC05-00OR22725.

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Date submitted: 15 Jul 2016 Electronic form version 1.4