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Category Number and Subject: 6.20 DIII-D Tokamak

[] Theory [x] Experiment

Snowflake Divertor Configuration Studies in DIII-D Tokamak,* V.A. Soukhanovskii, S.L. Allen, B.I. Cohen, M.E. Fenstermacher, D.N. Hill, C.J. Lasnier, M.A. Makowski, A.G. McLean, W.H. Meyer, T.D. Rognlien, D.D. Ryutov, *LLNL*; E. Kolemen, *PPPL*; R.J. Groebner, A.W. Hyatt, A.W. Leonard, T.H. Osborne, T.W. Petrie, *GA*; J.A. Boedo, *UCSD*; J.G. Watkins, *SNL* – Experiments in DIII-D show the snowflake divertor (SFD) configuration is compatible with high performance operation ($H_{98y2} \geq 1$) and results in greatly reduced divertor heat flux between and during edge localized modes (ELMs). The SFD was sustained for many energy confinement times using the standard poloidal field shaping coils in 3-5 MW neutral beam injection-heated discharges. Pedestal and divertor effects resulting from a large region of reduced poloidal magnetic field in the SFD are measured and studied using the 2D multi-fluid code UEDGE. The pedestal pressure appeared to be unchanged, while the energy loss per ELM was reduced by 50%. Partial detachment of the SFD was observed at higher n_e , with an expanded divertor radiation zone and peak ELM heat flux reduced by up to 80%.

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