Abstract Submitted
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Dependence of H-mode Power Threshold on Input Torque and Toroidal Plasma Rotation in the DIII-D Tokamak[1] P. GOHIL, General Atomics, G.R. MCKEE, D.J. SCHLOSSBERG, U. Wisc.-Madison, G. WANG, UCLA — The power required to induce the L-H transition is dependent on the applied beam torque. For upper single-null discharges in which the ion ∇B drift is away from the X-point, the L-H transition power threshold is reduced by up to a factor of 3 by changing from predominantly co (4-6 MW) to predominantly counter-injection (<2 MW). Lowered L-H transition power thresholds are also observed with reduced input torque in discharges with the ion ∇B drift towards the X-point, but to a lesser degree. For the first time, an H-mode transition was induced by slowly reducing the input torque at constant input power by slowly varying the mix of co- and counter-beam injection. The mechanisms for such a torque dependence are being investigated from analyses of the edge plasma rotation, the edge radial electric field and the edge plasma turbulence. Preliminary results indicate large changes in the poloidal velocity shear of the edge turbulent eddies prior to the L-H transition that may be strong enough to induce the transition.

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