Abstract Submitted
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Expansion of Parameter Space for Wide-Pedestal, Quiescent H-mode Plasmas in DIII-D[1] KEITH BURRELL, General Atomics — QH-mode is an attractive operating regime for future devices since it has excellent energy confinement time and operates without ELMs at zero net NBI torque. The recently discovered wide pedestal QH-modes exhibit an increase in the pedestal pressure height and width and increased global energy confinement associated with a bipolar change in the ExB shear [1]. Experiments in 2017 have investigated the underlying physics by expanding the parameter space for wide pedestal QH-mode. It has now been created in LSN discharges with dRsep $\geq$ -1.5 cm and sustained with dRsep $\geq$ -3.5 cm; previous experiments required balanced DN plasmas or USN with dRsep $\leq$ 1 cm. A wide range of NBI torque was used to sustain the wide pedestal, from -2.5 Nm (counter-Ip) to 1.9 Nm (co-Ip); this greatly exceeds the ITER-equivalent torque range. The wide pedestal state with broadband MHD can be created directly from standard ELM-free conditions without the presence of the coherent EHO in plasmas using -1.5 Nm NBI torque. The time integrated torque required to reach and sustain the wide pedestal state has been reduced by over 90%, limited by core tearing modes. This is an important step on the road to use QH-mode in future devices with much lower equivalent NBI torque. [1] K.H. Burrell et al, Phys. Plasmas 23, 056103 (2016)

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