Abstract Submitted
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Stability and Confinement of ITER Baseline Scenario Plasmas in DIII-D[1] T.C. LUCE, T.W. PETRIE, G.L. JACKSON, GA, F. TURCO, Columbia U., W.M. SOLOMON, PPPL — Recent experiments extended plasma conditions typical of the ITER baseline scenario for $Q = 10$ operation ($q_{95} = 3$, $\beta_N = 1.8$) in the direction of low applied torque and low collisionality while maintaining $T_e = T_i$. These are key parameters where the worldwide H-mode database differs significantly from conditions expected in ITER, due to the use of co-injected neutral beam (co-NBI) heating. Here, balanced NBI and electron cyclotron heating (ECH) are used. Assessment of the global confinement using the IPB98y,2 scaling indicates confinement is good ($H_{98y2} \geq 1.0$) at low torque (<1 Nm). The stability of these plasmas is different from those with co-NBI, with most becoming unstable to $n = 1$ tearing modes that lock to the lab frame and grow, leading to loss of confinement. Since the $n = 1$ mode often appears soon after the plasma reaches the target β_N, the issue may be access to stable conditions or the absence thereof. Stability is enhanced when the ELMs and edge conditions are modified by deuterium flow on the outboard side of the plasma for radiative divertor operation, which may indicate a key role of the pedestal current density in the $n = 1$ tearing mode stability at $q_{95} = 3$.

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