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Theory       Experiment

**Extension of DIII-D Hybrid Plasmas Towards Operation with  $T_e \sim T_i$  and Low Rotation,\*** E.J. Doyle, *UCLA*, and the Hybrid Scenario Thrust Team – DIII-D hybrid plasmas typically operate in a hot ion mode ( $T_i > T_e$ ) with high plasma rotation, which tend to reduce turbulent transport. Recent DIII-D experiments extend hybrid operation to more reactor relevant conditions, with low plasma rotation and  $T_e \approx T_i$ . Using electron cyclotron (EC) heating to replace part of the neutral beam heating,  $T_e/T_i$  has been increased to  $\sim 0.8$  in hybrid plasmas with  $\beta_N = 2.6$ , with minimal effect on confinement time and a modest reduction in plasma rotation. The plasma turbulence level increased significantly in the EC heated hybrid plasmas, at both low and intermediate wavenumbers, as measured by BES and FIR scattering systems. Central Mach number in DIII-D hybrid plasmas has been scanned across a wide range, from 0.07 to 0.6. At low rotation, the confinement factor  $H_{89}$  degrades, typically by 10%-30%. Transport modeling using the GLF23 code indicates that the change in transport with rotation can be accounted for by changes in the ExB shearing rate.

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