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Theory Experiment

Dependence of DIII-D Hybrid Scenario on Dimensionless Parameters,* C.C. Petty, J.C. DeBoo, J.R. Ferron, R.J. La Haye, T.C. Luce, P.A. Politzer, R. Prater, M.R. Wade, *GA*; G.R. McKee, *U. Wisc.-Madison*; L. Vermare, *CNRS*; M. Murakami, *ORNL*; E.J. Doyle, *UCLA* – Experiments on DIII-D have studied the dependence of the hybrid scenario on Mach no., beta, and relative gyroradius. An MHD study varied the central Mach no. between 0.75 and 0.13 using co/ctr NBI; below this lower limit the 3/2 tearing mode slowed down and locked. Interestingly, suppression of the 3/2 mode using ECCD did not allow smaller Mach # to be accessed because of the onset of a 2/1 mode. A moderate beta degradation of confinement was observed for normalized beta between 1.5 and 2.7. The unfavorable beta dependence existed mainly in the electron channel, perhaps indicating magnetic flutter transport. The relative gyroradius scaling of local transport was close to gyroBohm-like in the core; however, a less favorable edge dependence and broadening of the NBI profile resulted in a global scaling that was closer to Bohm-like. This relative gyroradius dependence is similar to H-mode plasmas at high q_{95} .

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