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Theory Experiment

Electron Cyclotron Modification of Profiles in Quiescent Double Barrier (QDB) Discharges on DIII-D,* T.A. Casper, C.J. Lasnier, J.M. Møller, *LLNL*, K.H. Burrell, P. Gohil, A.W. Leonard, P.B. Snyder, W.P. West, *GA*, E.J. Doyle, *UCLA*, J. Weiland, *Chalmers U.* — High performance QDB conditions form when an internal transport barrier is created with intense neutral-beam injection into quiescent H-mode plasmas. We are exploring a variety of techniques to improve QDB parameters. In experiments using ECH/ECCD we observed a strong dependence on the q-profile when EC-power is used inside the core transport barrier. While strong electron heating is observed, we also observe a drop in the other core parameters; T_i , rotation, n_e and impurities. These dynamically changing conditions provide a scan of core temperature profile ratio with $0.3 < (T_e/T_i)_{\text{axis}} < 0.8$ observed. We are exploring the correlation and effects of observed density profile changes with respect to these time-dependent variations in the temperature ratio. Thermal and particle diffusivity calculations indicate a consistency between the rise in temperature ratio and an increase in transport corresponding to the changes in density.

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