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High Performance ITB Plasmas in Alcator C-Mod[1] C.L. FIORE, N.P. BASSE, P.T. BONOLI, D.R. ERNST, A.E. HUBBARD, M.J. GREENWALD, E.S. MARMAR, J.E. RICE, S.M. WOLFE, S.J. WUKITCH, K. ZHUROVICH, MIT-PSFC, P.E. PHILLIPS, UTA-FRC — Internal transport barrier plasmas with average pressure greater than 1 atmosphere have been obtained in Alcator C-Mod using two techniques. In one method, high magnetic field (6.3T) and high plasma current (1.3 MA) are combined with 3 MW off-axis ICRF power to optimize the performance. In the other, high off-axis power ($>$ 2.3 MW) is used to create an ITB plasma which is then heated with central ICRF power. To form an ITB in the pressure channel, particle and thermal flux is reduced in the barrier region which then allows the Ware pinch to peak the central density while maintaining the central temperature. Gyrokinetic code simulation suggests that steepening of the density profile destabilizes TEM modes inside the barrier, ultimately driving sufficient outgoing particle flux to balance the inward pinch and halt further density rise. Experimentally, increasing levels of density fluctuations are observed as the central density peaks, although the location of these fluctuations is not resolved. This report will examine the recent high power operation and explore the implications of increased turbulent transport on high power operation.

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