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Extension of high poloidal beta scenario in DIII-D to lower q95 for steady state fusion reactor[1] J. HUANG, X. GONG, J. QIAN, S. DING, Q. REN, W. GUO, C. PAN, G. LI, T. XIA, ASIPP, A. GAROFALO, L. LAO, A. HYATT, J. FERRON, C. COLLINS, D. LIN, GA, G. MCKEE, UW, T. RHODE, UCLA, J. MCCLENAGHAN, ORNL, C. HOLCOMB, LLNL, L. CUI, PPPL, W. HEIDBRINK, Y. ZHU, UCI, DIIID TEAM, EAST TEAM — DIII-D/EAST joint experiments have improved the high poloidal beta scenario with sustained large-radius internal transport barrier (ITB) extended to high plasma current I_p~1MA with q95~6.0. Slight off-axis NBCD is applied to obtain broader current density profile, ITBs can now be sustained below the previously observed β_p threshold with excellent confinement (H_{98y2}~1.8). The scenario also exhibits a local negative shear appearing with q increased at rho~0.4, which helps ITB formation and sustainment. This confirms TGLF prediction that negative magnetic shear can help recover ITB and achieve high confinement with reduced q95. Detailed analysis shows that the Shafranov shift and q profile is critical in the ITB formation at high β_p regime.

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