Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Impact of Central ECCD on Steady-State Hybrid Scenario in DIII-D[1] C.C. PETTY, M.A. VAN ZEELAND, D.C. PACE, XI CHEN, R. PRATER, GA, R. NAZIKIAN, B.A. GRIERSON, E. KOLEMEN, PPPL, G.R. MCKEE, UWM, F. TURCO, Columbia U. — In steady-state hybrid plasmas with zero surface loop voltage, 3.4 MW of central ECCD drives $\approx$ 0.2 MA out of $\approx$ 1.0 MA plasma current with concurrent changes in sawteeth, Alfvén eigenmodes (AE) and thermal transport. While the hybrid scenario normally does not sawtooth because q_{min} >1, localized ECCD (with calculated peak magnitudes of $\sim$ 6 MA/m^2) causes sawteeth to appear, indicating that the intense ECCD overwhelms the flux pumping mechanism. In hybrid plasmas with NBI heating only, strong AE activity leads to high beam ion transport coefficients of $\sim$ 2 /m^2/s. During central ECCD, this AE activity is suppressed, replaced by a bursty n=1 energetic particle mode with low beam ion transport coefficients of $\sim$ 0.3 /m^2/s. While central electron heating raises electron thermal transport, increasing χ_e by $\approx$100% for 3.4 MW of ECCD, the confinement factor is little changed as the higher thermal transport is offset by the decreased fast ion transport resulting from AE suppression.

[1]Work supported by US DOE under DE-FC02-04ER54698, DE-FG03-97ER54415, DE-FG02-99ER54541 and W-7405-ENG-48.

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Date submitted: 17 Jul 2015 Electronic form version 1.4