Abstract Submitted
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Validation of coupled core-edge pedestal-SOL modeling against DIII-D high beta discharges[1] J.M. PARK, D. GREEN, D. BATCHELOR, W. ELWASIF, ORNL, P.B. SNYDER, O. MENEGHINI, J. CANDY, General Atomics, K. KIM, SNU — A new core-edge pedestal-SOL modeling has been validated against the DIII-D experiments by integrating three independent, compound workflows of FASTRAN (1D core), EPED (edge pedestal), and C2 (2D SOL) within the Integrated Plasma Simulator (IPS) framework. The FASTRAN workflow computes all transport channels including the density, temperature, rotation, and plasma current, self-consistently with an EPED1 edge pedestal, MHD equilibrium, external heating and current drives. The particle and energy fluxes are matched at the separatrix between the FASTRAN-EPED and C2 workflows in an iterative steady-state solution procedure to determine the density and temperature at the separatrix, which is used to provide improved EPED1 input and to efficiently close the strong dependency loop among the regions. The result reproduces the experimental profiles from the magnetic axis to divertor/wall for the DIII-D high β discharges, guiding an optimum core-edge solution for the $\beta_N > 4$ steady-state operation.

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