Abstract Submitted
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Modeling of the Current Profile Evolution in Hybrid Discharges on DIII-D[1] M.A. MAKOWSKI, T.A. CASPER, R.J. JAYAKUMAR, L.D. PEARLSTEIN, LLNL, C.C. PETTY, GA — Hybrid discharges are being studied as they offer the potential of improved performance over the ITER baseline scenario. In many discharges, a stationary state is reached in which the q-profile is everywhere above unity. The mechanism by which this occurs is not yet understood, but clearly involves anomalous current transport. This has been verified with simulations in which the current is evolved neoclassically. In such simulations q_{min} invariably falls below unity, in conflict with the experimental observations. By introducing a heuristic current in the simulation, the q-profile can be maintained above unity. The spatial structure of the heuristic current required to achieve this can shed light on the physical mechanisms causing the anomaly. Current evidence suggests that neoclassical tearing modes play a role in the current redistribution, as many features are correlated with their presence. We present the results of simulations of hybrid discharges and determine the spatial structure of a heuristic current source required to sustain the q-profile.

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