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Current density evolution in high qmin scenarios with the new DIII-D beam geometry[1] B S VICTOR, Lawrence Livermore Natl Lab, C T HOLCOMB, LLNL, K E THOME, General Atomics, B A GRIERSON, PPPL, J M PARK, ORNL, W WEHNER, General Atomics — Further development of a high-q_{min} ($\sim$2), high-β ($\sim$4) scenario is assisted by upgrades to the DIII-D tokamak. Available co-current neutral beam (NB) sources have increased from six to eight, four of which can be injected off-axis. The additional off-axis NB current drive and heating is predicted to broaden the current density and pressure profiles, and increases the ideal stability limit, thus enabling the higher β operations. This poster focuses on how the new NB injection capabilities affect the evolution of the current density profile in this high-q_{min} scenario. The increased NB power drives additional current in two ways: direct NB current drive and bootstrap current driven by a change in the temperature and density profiles. TRANSP simulations with experimentally inferred fast ion diffusion predict that the increase in bootstrap current has the larger effect on the broadening of the current density profile. We will report on experiments guided by these simulations, including direct comparisons of predicted and measured current density profiles. This will be used to compare the relative efficacy of on-axis NB, off-axis NB, and electron cyclotron current drive.

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