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Simulations of NTM Stabilization using Current Drive Offset Relative to the ISLAND Center[1] JENNIFER WOODBY, EUGENIO SCHUSTER, ARNOLD KRITZ, GLENN BATEMAN, ALEXEI PANKIN, Lehigh University — High plasma pressure can cause simply nested magnetic flux surfaces to tear and reconnect, leading to the formation of magnetic islands. The neoclassical tearing mode (NTM) instability drives magnetic islands to grow to saturated widths, at which the islands can persist stably. The presence of magnetic islands leads to a local flattening of the pressure profile and locally hollow current profile within the island. The flattening of the pressure profile is undesirable in that it can result in degradation of plasma confinement. One common method of stabilizing NTMs and shrinking the magnetic islands is to replace the diminished currents within the islands using direct current injection via electron cyclotron current drive. Maximum stabilization is achieved when current is driven at the island center, the location of which is not accurately known in experiments. In this study, the current drive is expressed mathematically as a Gaussian current drive density in Hamada coordinates. The effect of current drive offset relative to the island center is investigated in preparation for feedback control.

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