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Gyrokinetic particle simulation of internal kink modes in DIII-D[1] JOSEPH MCCLENAGHAN, ZHIHONG LIN, University of California, Irvine — Magnetohydrodynamic (MHD) instabilities excited by equilibrium current in toroidal fusion devices play important roles in plasma stability and confinement. Kinetic effects are important in the excitation and saturation of the MHD modes, as well as resulting transport. In this work, we have applied Gyrokinetic Toroidal Code (GTC) to study kinetic effects in current-driven MHD modes. As the first step, we have performed GTC simulation of the n=m=1 internal kink mode, which has been studied extensively in tokamak experiments, theory and MHD simulations. We compare the dispersion relation and mode structure from the simulation to the ideal MHD theory in a low beta limit to verify the gyrokinetic simulation of current-driven MHD modes. As a next step, we simulate the internal kink mode in a realistic DIII-D geometry.

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