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Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory Experiment

Modulated Electron Cyclotron Current Drive for Control of the $m/n=2/1$ Neoclassical Tearing Mode in DIII-D,* A.S. Welander, *General Atomics*, and the DIII-D NTM Control for ITER Thrust Team – The $m/n=2/1$ neoclassical tearing mode (NTM) is a helical island structure at $q=2$ in the magnetic field of a high beta tokamak plasma that can degrade confinement and lead to disruption. The DIII-D control system has previously suppressed this NTM by driving continuous-wave (cw) current at $q=2$ using localized electron cyclotron current drive (ECCD). The control system has now been upgraded to modulate the ECCD so that current is driven only when the island passes by the deposition point. This modulation is expected to increase the effectiveness of the ECCD, in particular when the deposition region is broad relative to the island width, as will be the case in ITER. Experiments using modulated ECCD with a broad profile relative to the island width have been performed in DIII-D to control the $2/1$ NTM. Results of these experiments will be presented.

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