Abstract Submitted
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Modeling and Analysis for Tearing Mode Stability in DIII-D Hybrid Discharges[1] KYUNGJIN KIM, Seoul National U./Oak Ridge National Laboratory, J.M. PARK, M. MURAKAMI, Oak Ridge National Laboratory, R.J. LA HAYE, General Atomics, YONG-SU NA, Seoul National U., DIII-D TEAM — Plasma rotation in DIII-D hybrid scenario plasmas is found to change the stability of tearing modes (TMs) in a profound manner. It is important to understand the onset threshold and the evolution of TMs for developing a high-performance steady-state fusion reactor. The modified Rutherford equation (MRE) estimates the growth rate of an island and is used to analyze the TM stability. The change in TM stability was investigated in hybrid plasmas with various conditions including rotation, normalized beta, q profile, and so on. The measured island width is larger in low q_{95} cases and increased as plasma rotation was reduced. The island width calculated by MRE with TM stability index Δ' assumed from its poloidal mode number, -m/r, showed a good agreement during high rotation, but could not be matched to the experimental island width at lower rotation. Simulations of TMs using resistive MHD codes such as NIMROD and PEST3 will also be presented and compared with experiments to determine the possibility for predicting TM onset by Δ' calculation.

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