Modeling Steady-State DIII-D Plasmas for Tearing Stability Studies,* F. Turco, ORAU, T.C. Luce, General Atomics, D.P. Brennan, U. Tulsa, A.D. Turnbull, J.R. Ferron, C.C. Petty, P.A. Politzer, General Atomics, L.L LoDestro, L.D. Pearlstein, R.J. Jayakumar, T.A. Casper, C.T. Holcomb, LLNL, M. Murakami, ORNL— In DIII-D, steady-state high-β discharges are limited by a $n=1$ tearing mode, causing a radial redistribution of the current density not recoverable with the available non-inductive current drive sources. The use of electron cyclotron (EC) current with a broad deposition can prevent the mode onset. The current density profile from an experimental DIII-D equilibrium has been perturbed numerically, mimicking the injection of EC current. The tearing stability index $\Delta'$ is evaluated by the PEST3 code as a function of the perturbation amplitude, shape and radial position. The results are compared to the evolution of the experimental current density found previously to characterize discharges unstable to the $n=1$ tearing instability, and to a previous analytical study performed in cylindrical geometry for similar conditions.

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