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Simulation of Island Dynamics for Design of NTM Control¹ A.S. WELANDER, D.A. HUMPHREYS, R.J. LA HAYE, General Atomics, A. TRUNOV, Intelligent Optical Systems — One limiting factor for advanced tokamak operation is the 3/2 neoclassical tearing mode (NTM) which imposes significant limits on achievable values of normalized plasma beta [1]. Real time suppression of the mode can be achieved by very localized deposition of electron cyclotron current drive (ECCD) at the $q=3/2$ surface [2]. The exact alignment of the ECCD can be controlled by modification of the radial position of the plasma as well as by other methods. Both the modified Rutherford equation and empirical models that describe the dynamic response of the mode to application of ECCD are investigated. Both approaches use the misalignment of the ECCD as an input parameter. Misalignment is estimated based on a comparison between predicted and measured mode evolution. This analysis will then be used to further improve the “Search and Suppress” algorithm [3] for faster mode suppression.

[1] R.J. La Haye, *et al.*, Nucl. Fusion **37**, 397 (1997).

[2] H. Zohm, *et al.*, Phys. Plasmas **8**, 2009 (2001).

[3] R.J. La Haye, *et al.*, Phys. Plasmas **9**, 2051 (2002).

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