

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

An analysis of the evolution of two coupled neoclassical tearing mode islands¹ H. MOHAMMADI, D.P. BRENNAN, University of Tulsa — It has long been experimentally observed that two neoclassical tearing mode islands resonant at different magnetic surfaces tend not to coexist. To address this, we describe the temporal evolution of each magnetic island width using the modified Rutherford equation (MRE). This equation can be obtained by integrating Ampere's law across a magnetic island region in a radially infinite cylindrical plasma. Ohm's law is used to express the polarization, curvature and neoclassical effects on the island evolution. But in experiment, the geometry and equilibrium profiles of the evolving system impose linear drive terms that differ for each magnetic island. Also, the islands are coupled through their perturbations. Both effects alter the evolution of the island widths dramatically. In this work, we develop a two island MRE code with accurate linear drive terms and coupled effects for both islands. With this code we investigate how these couplings could explain the noted experimental observations.

¹Supported by US DOE Grant DE-FG02-07ER54931.

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Date submitted: 16 Jul 2010

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