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**Analysis of Island Formation Due to RMPs in D3D Plasmas Using SIESTA**[1] STEVEN HIRSHMAN, MORGAN SHAFER, SUDIP SEAL, JOHN CANIK, Oak Ridge National Laboratory — By varying the initial helical perturbation amplitude of Resonant Magnetic Perturbations (RMPs) applied to a Doublet III-D (DIII-D) plasma, a variety of meta-stable equilibrium are scanned using the SIESTA MHD equilibrium code. It is found that increasing the perturbation strength at the dominant m=2 resonant surface leads to lower MHD energies and significant increases in the equilibrium island widths at the m=2 (and sidebands) surfaces. Island overlap eventually leads to stochastic magnetic fields which correlate well with the experimentally inferred field line structure. The magnitude and spatial phase (around associated rational surfaces) of resonant (shielding) components of the parallel current is shown to be correlated with the magnetic island topology.

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Steven Hirshman
Oak Ridge National Laboratory

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