Application of SIESTA to Well and Hill Equilibria in HSX[1] C.R.
COOK, University of Wisconsin, S.P. HIRSHMAN, R. SANCHEZ, Oak Ridge National Laboratory — HSX (the Helically Symmetric eXperiment) is a quasi-helical
4 field-period stellarator at the University of Wisconsin-Madison. Previous Biot-
Savart field-line following code work done on HSX shows a large 4/4 island chain in
the 6.2% Hill configuration and an 8/7 island chain in the 6.2% Well configuration.
However, these simulations were all done in vacuum conditions. SIESTA (Scalable
Island Equilibrium Solver for Toroidal Applications) is a three-dimensional magnetohydrodynamic code used to compute equilibria with islands and stochastic regions
in finite-pressure, toroidally-confined plasmas. The very strong helical shaping of
the HSX magnetic field structure requires a large number of toroidal integration
points and toroidal modes. The requirements to obtain good convergence in these
simulations are described. The equilibria found running SIESTA on the Well and
Hill configurations are discussed and compared to the vacuum field-line results.

Steven Hirshman
Oak Ridge National Laboratory

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