

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Quasi-symmetry in a torsatron device¹ F. BUNT, A.S. WARE, University of Montana — Initial exploration of an optimization of quasi-symmetric magnetic configurations using torsatron coils is presented. Quasi-symmetry of the magnetic field strength in flux coordinates can result in three-dimensional magnetic confinement devices achieving confinement comparable to axisymmetric configurations. Previous optimization of quasi-symmetric configurations have been done using modular coils, including the designs of the currently operating HSX stellarator and the W7-X stellarator which is under construction. In this work, different classes of quasi-symmetric configurations are examined using parameterized torsatron coils as the basis of the optimization. This is a numerical investigation in which equilibria are optimized for different quasi-symmetries, number of helical coils, and number of field periods, but with other parameters such as average field strength, major radius, and aspect ratio, equivalent across the configurations. Equilibrium and stability characteristics will be compared across the configurations.

¹Work supported by U.S. Department of Energy under Grant DE-FG02-03ER54699 at the University of Montana.

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Date submitted: 19 Jul 2011

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