Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Bootstrap current, magnetic islands and ballooning stability in W7-X[1] STEVE MORENTE, ANDREW WARE, University of Montana, STEVEN HIRSHMAN, Oak Ridge National Laboratory — Computational modeling is used to calculate the expected bootstrap current in the Wendelstein 7-X stellarator and determine the impact of this current on the magnetic surfaces and ballooning stability. Pressure, density and temperature profiles have been selected to match the profiles anticipated in W7-X. Finite-β, free-boundary equilibria have been obtained with the VMEC code and analyzed for bootstrap current (BOOTSJ), ballooning stability (COBRAVMEC) and magnetic structure (SIESTA). The bootstrap current can impact the rotational transform profile and thus, the location of magnetic islands near the edge of W7-X. The possibility of controlling the rotational transform profile using planar coils is examined.

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

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Date submitted: 14 Jul 2016 Electronic form version 1.4