Abstract Submitted
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**Resilient non-resonant divertors for stellarators**[1] A. BADER, University of Wisconsin-Madison, A. H. BOOZER, University of Columbia, C.C. HEGNA, University of Wisconsin-Madison, S.A. LAZERSON, PPPL — In this work, we investigate whether resilient non-resonant divertor solutions exist for optimized stellarators. Resiliency is measured by the consistency of performance over a broad range of operational states, such as through bootstrap current and modified plasma pressures. A non-resonant configuration is one where the crucial topological feature is the existence and sharpness of ridges along the last closed flux surface. We develop a modified field-line following method for testing the resiliency of stellarator divertors and apply it to altered HSX configurations generated by varying external coil currents, wall positioning, and internal plasma currents. We compare a magnetic diffusion calculation with a "zero-diffusion" calculation that endeavors to measure the first escaping flux tubes. The results from these calculations are corroborated with a more complete edge simulation with EMC3-EIRENE. The EMC3-EIRENE simulations show resilient helical stripes that are consistent with the simpler field line following methods. The goal of the study is to find a metric for edge/divertor optimization of stellarators, a crucial piece that is missing from current optimization schemes.

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