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Evaluating Stellarator Divertor Designs with EMC3[1] AARON BADER, D.T. ANDERSON, University of Wisconsin - Madison, Y. FENG, IPP Greifswald, C.C. HEGNA, J.N. TALMADGE, University of Wisconsin - Madison — In this paper various improvements of stellarator divertor design are explored. Next step stellarator devices require innovative divertor solutions to handle heat flux loads and impurity control. One avenue is to enhance magnetic flux expansion near strike points, somewhat akin to the X-Divertor concept in Tokamaks. The effect of judiciously placed external coils on flux deposition is calculated for configurations based on the HSX stellarator. In addition, we attempt to optimize divertor plate location to facilitate the external coil placement. Alternate areas of focus involve altering edge island size to elucidate the driving physics in the edge. The 3-D nature of stellarators complicates design and necessitates analysis of new divertor structures with appropriate simulation tools. We evaluate the various configurations with the coupled codes EMC3-EIRENE, allowing us to benchmark configurations based on target heat flux, impurity behavior, radiated power, and transitions to high recycling and detached regimes.

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A. Bader
University of Wisconsin - Madison

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