Abstract Submitted for the DPP14 Meeting of The American Physical Society

Simulated Stellarator Edge Behavior with Modified HSX Coils¹ A. BADER, L.A. STEPHEY, D.T. ANDERSON, UW - Madison, Y. FENG, IPP Greifswald, C.C. HEGNA, O. SCHMITZ, J.N. TALMADGE, UW - Madison — Predicting the edge behavior of a 3D device is a difficult but necessary requirement in the design of new fusion devices. In this poster we focus on prototypical stellarators generated through modifications to the HSX coils. We employ both helical coils to change the island size without altering the rotational transform, and divertor dipole coils to alter the internal structure of the islands. To determine the edge behavior of the designs we use simple metrics obtained through vacuum field-line following along with advanced simulation capabilities from the coupled codes EMC3-EIRENE. We show that strike point locations and concentrations can be altered with substantial changes to edge island sizes. Changes to the internal structure of the islands, producing alterations to flow structures and plasma density, but do not have a significant impact on strike point calculations or predicted heat flux. Results have

implications on the role of islands in edges of stellarators and other 3D devices.

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Aaron Bader UW - Madison

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