

Abstract Submitted
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Island Divertor Plate Modeling for the Compact Toroidal Hybrid Experiment¹ G.J. HARTWELL, S.D. MASSIDDA, D.A. ENNIS, S.F. KNOWLTON, D.A. MAURER, Auburn University, A. BADER, University of Wisconsin — Edge magnetic island divertors can be used as a method of plasma particle and heat exhaust in long pulse stellarator experiments. Detailed power loading on these structures and its relationship to the long connection length scrape off layer physics is a new Compact Toroidal Hybrid (CTH) research thrust. CTH is a five field period, $\ell = 2$ torsatron with $R_0 = 0.75$ m, $a_p \sim 0.2$ m, and $|B| \leq 0.7$ T. For these studies CTH is configured as a pure stellarator using a 28 GHz, 200 kW gyrotron operating at 2nd harmonic for ECRH. We report the results of EMC3-EIRENE [1] modeling of divertor plates near magnetic island structures. The edge rotational transform is varied by adjusting the ratio of currents in the helical and toroidal field coils. A poloidal field coil adjusts the shear of the rotational transform profile, and width of the magnetic island, while the phase of the island is rotated with a set of five error coils producing an $n = 1$ perturbation. For the studies conducted, a magnetic configuration with a large $n = 1$, $m = 3$ magnetic island at the edge is generated. Results from multiple potential divertor plate locations will be presented and discussed.

[1] Y. Feng, M. Kobayashi, T. Lunt, and D. Reiter, Plasma Phys. Control. Fusion, 53 (2011) 024009

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