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Modeling of Divertor Plates in the Compact Toroidal Hybrid\textsuperscript{1}
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D.A. MAURER, Auburn University — In long pulse length stellarator experiments,
edge island divertors can be used as a method of plasma particle and heat exhaust.
Knowledge of the detailed power loading on these structures and its relationship to
the long connection length scrape off layer physics is a new Compact Toroidal Hybrid
research thrust. We report the results of connection length studies for divertor plates
to be installed in the Compact Toroidal Hybrid (CTH), a five field period torsatron
with $R_0 = 0.75$ m, $a_p \sim 0.2$ m, and $B \leq 0.7$ T. For these studies, CTH will be
operated as a pure stellarator with no ohmically generated plasma current. The
CTH edge rotational transform can be varied from $t_{vac}(a)=0.02–0.35$ by adjusting
the ratio of currents in the helical and toroidal field coils. A poloidal field coil is used
to adjust the shear of the rotational transform profile, and hence the size of edge
islands, 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
possible divertor plate locations relative to the island structure will be presented.

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