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Disruptions in current-driven discharges in the Compact Toroidal Hybrid experiment[1] S. KNOWLTON, G. HARTWELL, J. HANSON, B. STEVENSON, J. ECKBERG, Auburn University, K. KAMDIN, University of Chicago — Disruption avoidance in stellarators is relevant to helical configurations with tokamak-like levels of bootstrap current, e.g. quasi-axisymmetric devices, and stellarator-tokamak hybrids. Disruptions are investigated in the Compact Toroidal Hybrid (CTH) experiment (R_0 = 0.75 m, a $\sim$ 0.2 m, $B_0 \leq$ 0.7 T, $\bar{n}_e$ = 0.2 – 1.5 x 10^{19} m^{-3}), a flexible heliotron operating with significant ohmic current. At B_0= 0.5 T, the edge vacuum rotational transform is variable from ι_{VAC}(a) = 0.05 to 0.5gnd plasma currents up to 40 kA are driven in plasmas generated by electron-cyclotron resonant heating at 14 GHz. At the lowest vacuum transform ι_{VAC}(a) = 0.05, current-driven disruptions leading to a complete loss of plasma can be induced for a total rotational transform ι_{TOT}(a) $>$ 0.3 at plasma densities $\bar{n}_e \geq$ 0.8 x 10^{19} m^{-3}. Disruptions are preceded by m = 2 tearing activity. Complete disruptions have not yet been observed in CTH with h ι_{VAC}(a) $\geq$ 0.2, although partial current collapses can take place. Efforts are underway to study the transitional behavior of the disruptions as the vacuum transform is continuously raised.

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