Abstract Submitted
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Compact Toroidal Hybrid Research Program: Recent Progress and Future Plans[1] D.A. MAURER, M. CIANCIOSA, J.D. HANSON, G.J. HARTWELL, J.D. HEBERT, J.L. HERFINDAL, S.F. KNOWLTON, M.C. ARCHMILLER, P. TRAVERSO, M. PANDYA, X. MA, Auburn University — Understanding the control and avoidance of major disruptions in current carrying toroidal plasmas is important in mitigating the effects of rapid loss of confinement in future devices. The Compact Toroidal Hybrid (CTH) experiment is investigating the passive avoidance of disruptions with the addition of a small amount of vacuum transform provided by external coils. In ohmically-driven stellarator plasmas no disruptions of any kind are observed if the vacuum transform exceeds ~ 0.11. Recent progress on the suppression of low-q_a (high ι_a), density limit, and vertically unstable plasma disruptions is overviewed. Interpretation of these results makes use of 3D equilibrium reconstructions using the V3FIT code [1]. Several new diagnostic tools have recently been developed and implemented on CTH. These new research tools include multi-chord interferometry, bolometry, Hα emission detection, a two-color soft x-ray camera, and upgraded magnetic sensor arrays. In addition to these diagnostic improvements, a new 200 kW gyrotron system will provide additional heating power for stellarator target plasmas. Future research directions and plans will also be discussed.

[1] J. D. Hanson, S. P. Hirshman, S. F. Knowlton, L. L. Lao, E. A. Lazarus, J. M. Shields, Nucl. Fusion, **49** (2009) 075031

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