

Abstract Submitted  
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**MHD mode analysis of magnetic fluctuations on the Compact Toroidal Hybrid**<sup>1</sup> M.D. PANDYA, G.J. HARTWELL, S.F. KNOWLTON, D.A. MAURER, Auburn University — Strong MHD activity is typically observed in the Compact Toroidal Hybrid (CTH) when the value of the edge rotational transform,  $\iota(a)$ , is near rational values. A unique feature of the CTH torsatron-tokamak hybrid is that it operates with a variable level of vacuum rotational transform,  $t_{vac}$ , provided by the external torsatron coils. To measure MHD activity, CTH is equipped with poloidal and toroidal pick-up coil arrays. A new poloidal array with 36 pick-up coils to measure poloidal magnetic field and 18 to measure radial field, has been recently installed. During the current rise when  $\iota(a) \sim 1/2$  or  $1/3$ , rotating  $m/n=2/1$  or  $3/1$  modes respectively, are typically present. Fluctuation analysis using Singular Value Decomposition (SVD) [1,2] leads to identification of dominant spatial and temporal modes present in the plasma. Prior to density-limit disruptions, a  $2/1$  mode is observed to grow and lock in the laboratory frame for discharges with low vac. transform  $t_{vac}(a) \leq 0.08$ . However, for  $t_{vac}(a) > 0.1$  the  $2/1$  mode is saturated, and a relatively weak  $3/2$  mode is also present prior to disruption.

[1] Dudok de Wit et al., Phys. Plasmas 1 (1994),3288

[2] Kim et al., PPCF 41 (1999),1399

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