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MHD Mode Analysis of Magnetic and H_α Fluctuations on the Compact Toroidal Hybrid[1] M.D. PANDYA, G.J. HARTWELL, S.F. KNOWLTON, X. MA, D.A. MAURER, Auburn University — Strong MHD activity is typically observed in Compact Toroidal Hybrid (CTH) when the edge transform, ι_a, is near rational values. CTH is equipped with poloidal and toroidal pick-up coil arrays that measure the poloidal magnetic field. Two poloidal arrays separated toroidally by 180° have 16 coils each and two toroidal arrays located at poloidal angles of $\theta = \pm 90°$ have 10 coils each. A seven channel array of H_α ($\lambda = 656nm$) detectors has been recently installed and is operational. The plasma is viewed by these detectors on horizontal chords above and below the midplane. 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) leads to identification of the dominant spatial and temporal modes present in the plasma. Comparison of observed MHD activity during the initial current rise for low edge transform ($\iota_{vacuum} \sim 0.04$) and high edge transform ($\iota_{vacuum} \geq 0.1$) cases will be presented. Also, the structure of magnetic and H_α fluctuations before density limit and low-q disruptions will be discussed.

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