Abstract Submitted
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**Measurement of beam-driven Alfvénic instabilities in MST and comparison to predictions**[1] E. PARKE, UCLA, J. K. ANDERSON, J. BOGUSKI, P. J. BONOFIGLO, UW-Madison, D. L. BROWER, W. X. DING, UCLA — Neutral beam injection in MST drives a variety of energetic particle modes (EPMs) and Alfvénic modes (AEs). These instabilities can lead to avalanche processes with enhanced fast ion transport, the most commonly observed avalanche involving coupling between modes with toroidal number n = 5, 4, and -1. Density fluctuations correlated with these avalanches, as well as internal magnetic fluctuations associated with the dominant, n = 5 EPM, have previously been characterized with the FIR interferometer-polarimeter. However, the n = 4 and -1 AEs were too weak to observe with polarimetry. Recent upgrades to the interferometer-polarimeter have further reduced the noise floor for fluctuation measurements. The upgraded system allows clear identification of Faraday rotation fluctuations associated with the n = -1 AE. These fluctuations are highly localized, with narrow structure peaking at the same location as the density fluctuations. Previous work has established that the n = 4 and -1 fluctuations are consistent with island-induced AEs (IAEs). Measured structures are compared to predictions for IAEs as well as helicity-induced AEs, and ongoing work to resolve the dependence of observed structures on tearing mode island phase and identify n = 4 correlated fluctuations is presented.

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Eli Parke
UCLA

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