

Abstract Submitted  
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**Measurement of magnetic fluctuations in HSX Stellarator**<sup>1</sup> S. OH, A.F. ALMAGRI, D.T. ANDERSON, J.N. TALMADGE, J.C. SCHMITT, HSX Plasma Laboratory, U. of Wisconsin-Madison, D.L. BROWER, C. DENG, University of California, Los Angeles — Magnetic fluctuations are a strong feature of HSX ECRH plasma at densities up to  $2.0 \times 10^{12} \text{ cm}^{-3}$ . We observe a coherent mode at 40-50 kHz with a poloidal mode number  $m=0$  in a broad plasma density range. The mode's amplitude and frequency depend on plasma density and the heating location and the mode is well correlated with density fluctuations. Plasma biasing changes the frequency and amplitude of this mode. We also observe a bursty mode at density below  $0.5 \times 10^{12} \text{ cm}^{-3}$ . At this density range we also observe the presence of hard x-rays generated by a fast electron tail. This mode at frequency of about 120 kHz has an  $m=1$  poloidal structure and has a large impact on the plasma confinement. We observe large decreases in the stored energy and ECE signal, and large increases in the soft X-ray signal at the onset of this mode. This mode is observed only with a near-axis heating location. We plan to measure the toroidal  $n$  spectrum of these modes and understand what drives these modes unstable. Initial results of these magnetic studies will be presented.

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