

Abstract Submitted
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Core Density Fluctuation Measurements by Interferometry in the HSX Stellarator¹ C. DENG, D.L. BROWER, University of California, Los Angeles, D.T. ANDERSON, F.S.B. ANDERSON, A. BRIESEMEISTER, K.M. LIKIN, J.N. TALMADGE, R. WILCOX, K. ZHAI, HSX Plasma Lab, University of Wisconsin-Madison — The measurement of density fluctuations by the multi-channel interferometer system on the HSX stellarator has shown a variety of density fluctuation characteristics. Both coherent and broad band density fluctuation modes are observed in the plasma core. For quasi-helically symmetric plasmas with $B_T=1.0$ T, significant increases (both amplitude and frequency) in the turbulent density fluctuation spectrum are observed when heating location changes from on-axis to high field side. The CHERS measurements show that the plasma flow velocities decrease significantly for off-axis heating and core fluctuations increase. In addition, a coherent mode with $f\sim 15$ kHz is observed with small displacement of the heating location inward. When HSX is operated without quasi-helical symmetry, the sensitivity of broadband density fluctuations to changes of heating location and ECRH power were not observed. At $B_T=1$ T and $n_e \sim 4 \times 10^{12} \text{ cm}^{-3}$, a coherent electrostatic mode at ~ 28 kHz is observed for the Mirror configuration. An attempt to identify the fluctuations modes will be made by exploring the relations between density fluctuations and different plasma parameters, heating locations, and configurations.

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