

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**Density Fluctuation Measurements by Far-Forward Collective Scattering in the HSX Stellarator**<sup>1</sup> C. DENG, D.L. BROWER, University of California, Los Angeles, D.T. ANDERSON, F.S.B. ANDERSON, K. LIKIN, J. LORE, J.C. SCHMITT, J.N. TALMADGE, R. WILCOX, K. ZHAI, University of Wisconsin-Madison — The multichannel interferometer system on the HSX stellarator is reconfigured to perform far-forward collective scattering measurements of electron density fluctuations. The collective scattering system has 9 viewing chords with 1.5 cm spacing. The source is a bias-tuned Gunn diode at 96 GHz with passive solid-state tripler providing output at 288 GHz ( $\sim 5$  mW). The scattered power is measured using a homodyne detection scheme. Far-forward collective scattering provides a line-integrated measurement of fluctuations within the divergence of the probe beam covering wave number range:  $k_{\perp} < 2$  cm<sup>-1</sup>. The perpendicular wave number consists of poloidal and radial contributions which vary with chord position. Comparison of density fluctuations measured using scattering and interferometry techniques will be made. Both coherent modes and broadband fluctuations are measured. Comparison of fluctuation amplitude and frequency spectra for quasi-helically symmetric and non-axisymmetric magnetic configuration will be presented.

<sup>1</sup>Work supported by US DOE contracts DE-FG02-01ER54615 and DE-FG02-93ER54222.

Chuanbao Deng  
University of California, Los Angeles

Date submitted: 17 Jul 2010

Electronic form version 1.4