Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Experimental study of Nonlinear, Multi-Scale Turbulence in the HSX stellarator S. OHSHIMA, Kyoto University, Kyoto, Japan, C.B. DENG, University of California, Los Angeles, R.S. WILCOX, Oak Ridge National Laboratory, TN, T. NISHIZAWA, A.F. ALMAGRI, K.M. LIKIN, J.N. TALMADGE, D.T. ANDERSON, F.S.B ANDERSON, S.R. SARFF, University of Wisconsin-Madison — Micro scale turbulence depends on parameters such as local magnetic shear and curvature, and also excitation and damping mechanisms of zonal flows relate to the topology of the configuration. In the HSX stellarator, the Langmuir probe measurements indicate that a nonlinear interaction exists among a zonal flow like mode in the frequency range up to 5 kHz, a coherent mode at 20 kHz, and broadband turbulence. These two coherent modes are interacting with broadband fluctuation, and moreover these modes couples with each other. Interestingly, the nonlinear interaction appears differently depending on the location on the flux surface, which demonstrates a toroidal asymmetry, attributed to three dimensional configurations, exists on the multi-scale interactions. The detail of the analysis results and a new dedicated experiment for zonal flow physics in HSX using a newly designed capacitive probe will be discussed in this poster.

Chuanbao Deng
Univ of California - Los Angeles

Date submitted: 16 Jul 2017 Electronic form version 1.4