Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Structure, Amplitude and Identification of CAEs and GAEs in NSTX[1] N.A. CROCKER, UCLA, E. BELOVA, E.D. FREDRICKSON, N.N. GORELENKOV, PPPL, W.A. PEEBLES, S. KUBOTA, UCLA, R.E. BELL, B.P. LEBLANC, J.E. MENARD, M. PODESTÀ, PPPL, K. TRITZ, JHU, H. YUH, Nova Photonics — Detailed measurements of high frequency Alfvén eigenmode (AE) amplitude and structure have been obtained in a high power (6 MW), beam-heated H-mode NSTX plasma (shot 141398) using a recently upgraded array of 16 fixed-frequency quadrature reflectometers. The observed modes are individually identified as either compressional (CAE) or global (GAE) AEs by comparison of their frequency and measured toroidal mode numbers with local Alfvén dispersion relations. High frequency AEs — driven by Doppler-shifted cyclotron resonance with beam ions — correlate with enhanced electron thermal transport. These kinds of modes have historically been identified variously as compressional (CAE) or global (GAE) Alfvén eigenmodes, but the identification has not proven conclusive. Identification is essential to understanding the extent of their effect, since the two types of modes have very different effects on resonant particle orbits. The modes identified as CAEs have higher frequencies and smaller toroidal mode numbers than the GAEs. Also, they are strongly core localized, in contrast with the GAEs, which also peak toward the plasma center but have much broader radial extent. The measurements are compared with results from the HYbrid and MHD simulation code, HYM.

[1]Work supported by U.S. DOE Contracts DE-FG02-99ER54527 and DE-AC02-09CH11466.

Neal Crocker
University of California, Los Angeles

Date submitted: 23 Jul 2012 Electronic form version 1.4