Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Experimental investigation of stability, frequency and toroidal mode number of compressional Alfvén eigenmodes in DIII-D[1] S TANG, Univ of California - Los Angeles, K THOME, Oak Ridge Associated Universities, D PACE, General Atomics, W.W. HEIDBRINK, Univ of California - Irvine, T.A. CARTER, N.A. CROCKER, Univ of California - Los Angeles, NSTX-U COLLABORATION, DIII-D COLLABORATION — An experimental investigation of the stability of Doppler-shifted cyclotron resonant compressional Alfvén eigenmodes (CAE) using the flexible DIII-D neutral beams has begun to validate a theoretical understanding and realize the CAE's diagnostic potential. CAEs are excited by energetic ions from neutral beams [Heidbrink, NF 2006], with frequencies and toroidal mode numbers sensitive to the fast-ion phase space distribution, making them a potentially powerful passive diagnostic. The experiment also contributes to a predictive capability for spherical tokamak temperature profiles, where CAEs may play a role in energy transport [Crocker, NF 2013]. CAE activity was observed using the recently developed Ion Cyclotron Emission diagnostic—high bandwidth edge magnetic sensors sampled at 200 MS/s. Preliminary results show CAEs become unstable in BT ramp discharges below a critical threshold in the range 1.7 – 1.9 T, with the exact value increasing as density increases. The experiment will be used to validate simulations from relevant codes such as the Hybrid MHD code [Belova, PRL 2015].

[1]This work was supported by US DOE Grants DE-SC0011810 and DE-FC02-04ER54698.

Shawn Tang
Univ of California - Los Angeles

Date submitted: 16 Jul 2017 Electronic form version 1.4