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Phase space gradient driven descrete compressional Alfven eigenmodes in NSTX and DIII-D NIKOLAI GORELENKOV, ERIC FREDRICKSON, PPPL, Princeton University, WILLIAM HEIDBRINK, University of California, Irvine — The spectrum of Compressional Alfvén Eigenmodes (CAE) is analyzed and shown to be discrete in tokamaks with low aspect ratio, such as NSTX, as well as in the DIII-D. The study is focused on recent similarity experiments on NSTX and DIII-D in which sub-cyclotron frequency instabilities of CAEs were observed at similar plasma conditions. The discrete spectrum of CAEs is characterized by three mode numbers (M, S, n), where M, S, and n are poloidal, radial and toroidal mode numbers, respectively. Expected mode frequency splitting corresponding to each of these mode numbers seem to be observed in experiments and is consistent with our numerical analysis. The polarization of the observed CAE magnetic field oscillations in NSTX was measured and also consistent with the numerical analysis, which helps to identify this activity as CAEs. CAE mode structure was simulated to be localized in both radial and poloidal directions with typical radial localization towards the plasma edge and poloidal localization at the low field side of the plasma cross section.

Nikolai Gorelenkov
PPPL, Princeton University

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