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Observation of Compressional Alfven Eigenmodes (CAE) in a Conventional Tokamak[1] M.S. KIM, W.W. HEIDBRINK, UCI, E.D. FREDRICKSON, N.N. GORELENKOV, PPPL, T.L. RHODES, UCLA, M.A. VAN ZEELAND, ORISE — Fast-ion instabilities with frequencies somewhat below the ion cyclotron frequency frequently occur in spherical tokamaks such as the National Spherical Torus Experiment (NSTX). NSTX and DIII-D are nearly ideal for fast-ion similarity experiments, having similar neutral beams, fast-ion to Alfven speed, fast-ion pressure, and shape of the plasma, but with a factor of 2 difference in the major radius. When DIII-D is operated at low field (0.6 T), CAE instabilities appear that closely resemble the NSTX instabilities. In particular, the mode frequencies, polarization, and beam-energy threshold are nearly identical to NSTX. CAE in high-field discharges and emission at cyclotron harmonics are also observed. As on NSTX, the basic stability properties are consistent with the idea that the instability is driven by anisotropy in the fast-ion velocity distribution and is damped predominately by Landau damping of electrons. The results suggest that these modes could be unstable in ITER.

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