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Discrete compressional Alfven eigenmode spectrum in NSTX and DIII-D NIKOLAI GORELENKOV, ERIC FREDRICKSON, PPPL, Princeton University, WILLIAM W. HEIDBRINK, University of California, Irvine — Sub-cyclotron frequency instabilities of Compressional Alfven Eigenmodes (CAE) observed in the similarity experiments on National Spherical Torus (NSTX) and DIII-D [W.W. Heidbrink, et.al. submitted to Nuclear Fusion] are analyzed numerically applying an ideal MHD code NOVA. The code uses the numerical equilibrium and recovered main properties of these modes predicted by the theory [N.N. Gorelenkov, et.al., Nucl. Fusion, v.42. 977 (2002)]. The discrete spectrum was obtained for CAEs, which are characterized by three quantum numbers (M,n,s), where M, n, and s are poloidal, toroidal, and radial mode numbers, respectively. In the analyzed cases, observed mode frequency splitting between s and s+1 branches is consistent with the one numerically obtained. Poloidal mode number splitting, i.e. between M and M+1 modes, is larger by a factor of two, which is possibly due to neglecting the Hall term. Obtained mode structures are used for the numerical stability analysis with the NOVA-K kinetic code. CAE properties and their implications are discussed.

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