

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Excitation of Beta-induced Alfvén-acoustic eigenmodes and q-profile MHD spectroscopy in NSTX.¹ NIKOLAI GORELENKOV, E.D. FREDRICKSON, PPPL, Princeton University, H.L. BERK, IFS, Austin, TX, NSTX TEAM — We report on observations and interpretations of a new class of global MHD eigenmode solutions arising in gaps in the low frequency Alfvén-acoustic continuum below the geodesic acoustic mode (GAM) frequency. These modes have been just reported [N. N. Gorelenkov *et.al.*, Phys. Letters A, doi:10.1016/j.physleta.2007.05.113 (2007)] are the result of coupling of the Alfvén and acoustic continua due to geodesic curvature. We show good quantitative comparison of the theory predictions with recent NSTX experiments on the observations of these modes, referred to as Beta-induced Alfvén - Acoustic Eigenmodes (BAAE). They exist near the extrema points of the Alfvén - acoustic continuum and can sweep up in frequency from zero value in the plasma frame as q-profile relaxes. We show that the measurements of BAAE frequency can be used to infer q_{min} in both reversed and monotonic q-profile plasmas. In NSTX experiments we see a correlation of the MSE measured q-profile evolution and BAAE instabilities. TRANSP code is used to understand q-profile evolution by comparing it to classical predictions.

¹Supported by DOE contracts No. DE-AC02-76CH03073 and DE-FG03-96ER-54346.

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Date submitted: 18 Jul 2007

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