Abstract Submitted
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Search for Alfvén Sound Eigenmodes in high beta KSTAR plasmas[1] M. PODESTA, C. Z. CHENG, G. J. KRAMER, R. NAZIKIAN, PPPL, J. S. KANG, J. KIM, T. RHEE, NFRI — At finite plasma beta, MHD theory predicts that mixed Alfvén/Sound Eigenmodes (ASE) can exist in frequency gaps produced by the coupling between Alfvénic and acoustic branches. Energetic ions from Neutral Beam (NB) injection can potentially drive ASE unstable. In turn, ASE with sufficiently large amplitude can affect transport properties and confinement of NB ions, thus resulting in degraded plasma performance. ASE destabilization is explored in NB heated, high-beta KSTAR discharges aimed at long-pulse scenario optimization, in which Alfvénic modes and other instabilities are observed to degrade fast ion confinement. The NOVA/NOVA-K codes are used in this study to identify and characterize potential instabilities in the ASE range of frequency for typical KSTAR high-beta parameters. Numerical results are compared with observations in terms of measured mode frequency, mode number spectrum and mode localization. Initial studies through the 'kick model' implemented in TRANSP are then discussed to explore the potential impact of ASE on fast ion confinement, in order to identify candidate AE mitigation/suppression strategies for high performance, long-pulse KSTAR scenarios.

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