



Study of beta-induced Alfvén eigenmode driven by runaway electrons in EAST tokamak

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The beta-induced Alfvén eigenmodes (BAEs) [1] excited by runaway electrons (REs) are observed in EAST low-density ohmic discharges. One or multiple-branches of BAEs can be obtained in this scenario

Characteristics of BAEs in EAST have been systematically investigated. The electron density during the existence of modes is lower than $0.6 \times 10^{19} \text{m}^{-3}$. The mode frequencies range from 10 to 20 kHz and are comparable to that of the continuum accumulation point of the lowest frequency gap, which is induced by the shear Alfvén continuous spectrum due to finite beta effect [2]. Furthermore, the mode frequency is proportional to the Alfvén velocity. The toroidal mode number $n=1$ is obtained by magnetic pickup probes.

statistically analyzed among one-branch to four-branch BAEs and results show that higher mode frequencies are prone to be excited when multiple branches are observed. Amount of REs is attribute to the different frequency branches of unstable BAEs: More REs are yielded by controlling the decrease of electron density in the current flattop, and the resistive plasma current is replaced by that carried by the REs as indicated by a large drop of the surface loop voltage. This result suggests that BAEs depend sensitively on the plasma beta contributed from REs.

References

- [1] W.W. Heidbrink *et al* 1993 *Phys. Rev. Lett.* 71 855.
- [2] Fulvio Zonca *et al* 1996 *Plasma Phys. Control. Fusion* 38 2011.

A same Experimental dates are

Note: Abstract should be in (full) double-columned one page.