

Abstract Submitted
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Sawtooth Stabilization and Onset of Alfvénic Instabilities Y.

NISHIMURA, C.Z. CHENG, National Cheng Kung University — Tokamak sawtooth instabilities can be stabilized by high energy particles as a consequence of conservation of the third adiabatic invariant.¹ On the other hand, termination of the stabilized period is reported due to the onset of Alfvénic instabilities (and thus the absence of the stabilizing mechanism).² In this work, employing a kinetic-fluid model,³ the interaction of m=1 resistive kink mode and high energy particles is investigated. The onset of Alfvénic instabilities is examined as a function of the inversion radius location.

¹D.J. Campbell *et al.*, Phys. Rev. Lett. **60**, 2148 (1988); F.Porcelli, Plasma Phys. Controlled Fusion **33**, 1601 (1991).

²S.Bernabei *et al.*, Phys. Rev. Lett. **84**, 1212 (2000); steeping of the pressure gradient (of high energy particle components) triggers Alfvénic instabilities.

³C.Z.Cheng and J.R.Johnson, J.Geophys. Res. **104**, 413 (1999).

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