Abstract Submitted
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The origin of the abrupt nonlinear growth in Double Tearing Mode MIHO JANVIER, YASUAKI KISHIMOTO, JIQUAN LI, Graduate School of Energy Science, Kyoto University — Reversed shear configuration represents an effective way to achieve a better confinement of the plasma inside tokamaks via the formation of Internal Transport Barriers (ITB). However, this configuration leads to MHD instabilities such as the Double Tearing Mode, where the dynamics are enhanced due to the presence of two rational surfaces. Kink type or tearing type evolutions of the DTM have been investigated and recently, an evolution in three regimes (linear, slowdown and fast growth) has attracted much attention [1][2]. However, there is still no clear explanation on the triggering mechanism leading to the nonlinear growth of the DTM and fast reconnection. Here, we investigate the physical process that leads to the fast growth regime and we try to understand the trigger mechanism as a result of secondary instability evolving at different time scales. We perform numerical simulations for the DTM in slab geometry by solving the 2-field reduced MHD equations and investigate the stability of the developed magnetic island with flow in the slowdown regime as a quasi-steady equilibrium with slow time scale. The high order magnetic structure is therefore found to play an important role in triggering the abrupt growth of the DTM flows. [1] Y.Ishii, *et al,* Phys. Rev. Lett., Vol.89,**20** (2002) [2] Z.X.Wang, *et al,* Phys. Plasmas, **15** 082109 (2008)

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