

Gyrokinetic Simulation of Energetic Particle Driven TAE Modes^{*}

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The continuum (Eulerian) electromagnetic global δf gyrokinetic code GYRO [1] is used to study the energetic particle driven TAE modes in the flux tube geometry. In this first study, the energetic particle distribution function (Alpha particles in the reactor) is approximately modeled using a high temperature Maxwellian. The TAE mode with its characteristic frequency at approximately half of the Alfvén transit frequency has been identified. The dependence of the mode frequency and growth rate on the toroidal mode number, background plasma pressure, plasma safety factor, shear of the configuration and above all the density gradient of the energetic particles are obtained. The combined effect of the simultaneous presence of a number of these TAE modes in the plasma on the plasma particles will also be reported.

[1] J. Candy and R.E. Waltz, J. Comput. Phys. **186**, 545 (2003).

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