

On the Excitation of Zonal Flows by Wave Particle Resonances

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Abstract

Excitation of zonal flows by ion temperature gradient driven modes has been studied using both fluid and kinetic models. Previous fluid derivations have shown that a strong excitation of zonal flows occurs through the nonlinearity in the energy equation and is enhanced by the fluid magnetic drift resonance. Thus a new derivation has been made by nonlinear kinetic theory, confirming that a strong excitation occurs through the kinetic magnetic drift resonance. Fluid and kinetic results are compared.