

Turbulent transport of alpha particles in reactor plasmas

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(Dated: April 27, 2006)

Abstract

We present a systematic study of the behavior of energetic species in reactor plasmas. Using self-consistent gyrokinetic simulations, in concert with an analytic asymptotic theory, we found that alpha particles interact strongly with core ion temperature gradient turbulence. Although similar in magnitude, the turbulent flux of particles is stronger than the energy flux in most cases. Perhaps the most surprising finding is that the fluxes per particle of alphas can be stronger than the main ion fluxes counterpart, as opposed to *conventional wisdom* where species with large gyroradii do not interact with the turbulence.

PACS numbers: 52.25.Fi, 52.25.Vy, 52.30.-q, 52.30.Gz, 52.55.Pi