

Locality and Universality in Gyrokinetic Turbulence

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The nature of nonlinear interactions in gyrokinetic turbulence, driven by the ITG instability, is investigated using direct numerical simulations in toroidal flux tube geometry. To account for the level of separation existing between scales involved in an energetic interaction, the degree of locality of the free energy scale flux is analyzed employing Kraichnan's infrared (IR) and ultraviolet locality functions. Because of the nontrivial dissipative nature of gyrokinetic turbulence, an asymptotic level for the locality exponents, indicative of a universal dynamical regime for gyrokinetics, is not recovered and an accentuated nonlocal behavior of the IR interactions is found instead, in spite of the local energy cascade observed.