

Quasi-Geostrophic wave turbulence

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I will consider quasi-geostrophic turbulence described by the Charney-Hasegawa-Mima equation. Both the kinetic and the discrete wave turbulence regimes will be discussed. I will describe additional (with respect to the energy and the zonestrophy) quadratic integrals of motion, and their influence on the turbulent cascades. In particular, I will explain how the zonestrophy invariant causes the energy cascade anisotropically to large zonal scales. I will describe the feedback loop mechanism in which the zonal flows suppress the small-scale turbulence. I will preview recent results for the two-layer ocean system.