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Transition Between Saturation Regimes of Gyrokinetic Turbulence DAVID HATCH, Institute for Fusion Studies, UT-Austin, FRANK JENKO, ALEJANDRO BANON NAVARRO, VASIL BRATANOV, Max Planck Institute for Plasma Physics — We examine the injection, spectral redistribution, and dissipation of free energy in a turbulent reduced-gyrokinetic system over a broad range of background gradients and collision frequencies. A Hermite representation is used for the parallel velocity coordinate, allowing for a detailed study of the scales of free energy dynamics over the entire phase-space. A type of *critical balance*—an equilibration of the parallel streaming time and the nonlinear correlation time—is observed for each order Hermite polynomial. This critical balance produces steep Hermite spectra, causing the collisional dissipation in parallel velocity space to peak at large velocity space scales even for very small collision frequencies. The dimensionless parameter L_T/L_C (the ratio of the temperature gradient scale length to the collisional mean free path) determines a transition between saturation regimes. For very small values of L_T/L_C the dissipation occurs mostly at small perpendicular scales. As L_T/L_C increases (but still much less than unity), the dissipation is dominated by large scales in *all* phase-space dimensions.

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