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Collisionless Heating in Gyrokinetic Turbulence[1] WILLIAM DORLAND, University of Maryland — Heating in weakly collisional, turbulent plasma in the gyrokinetic regime (strong guide field, low frequencies compared to cyclotron frequencies, small perturbations, weak or strong turbulence) is usually associated with Landau and Barnes damping, which in turn are associated with parallel acceleration of particles by turbulent electric and magnetic fields. We discuss a novel form of heating observed in gyrokinetics which is distinct from these conventional processes. A simple theoretical framework is presented to explain the mechanism, which might be called "perpendicular phase mixing." The theoretical framework allows one to distinguish and separate two components of heating (acceleration and thermalization) and to identify different mechanisms for each. Numerical results are shown which support the theory.

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