# Wave turbulence in weakly nonlinear system: Description via multiply-coupled triplets/quartets

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Behavior of weakly nonlinear dispersive waves (such as Alfven waves) is discussed via evolution of eigenmodes of associated linearized system and nonlinear interactions among them (triplet or quartet). First, we discuss time evolution of the multiply-coupled triplet system, which shows power low distribution of wave action at statistical equilibrium, intermittent evolution of wave amplitude,

and self-generation of phase correlation among the waves. Then we extend our analysis to some concrete nonlinear wave evolution equations such as the nonlinear Schrodinger equation (NLS) and the derivative nonlinear Schrodinger equation (DNLS), and argue that the discussions based on the multiply-coupled systems are quite useful in these nonlinear wave equations also.