1163-35-1214 **Charles Collot*** (`ccollot@cyu.fr`), 2 avenue Adolphe Chauvin, UFR Sciences et Techniques, Laboratoire AGM, 95302 Cergy-Pontoise, France, and **Pierre Germain**. *The role of the dispersion relation in the derivation of the kinetic wave equation.*

We consider the derivation of the kinetic wave equation, as an effective equation from the nonlinear Schrodinger equation (NLS) for the microscopic description of a system. The regime is weakly nonlinear, on a torus in any dimension greater than two, and for highly oscillatory random Gaussian fields as initial data. A conjecture in statistical physics is that there exists a kinetic time scale on which, statistically, the Fourier modes evolve according to the kinetic wave equation.

Several parameters are involved. First, the oscillation length of the field, and the strength of the nonlinearity, and it is still unknown in which regimes is the kinetic wave equation rigorously valid. Second, the coefficients of the dispersion relation - alternatively, the geometry of the torus. The distribution properties of the associated quadratic form on integer points are directly related to the structure of the resonant terms in the dynamics.

We approach the problem of the validity of the kinetic wave equation via the convergence and stability of the corresponding Dyson series. We prove that for certain regimes and dispersion relations the series diverges before the kinetic time. In others, we show its convergence and control the full solution almost up to the kinetic time. (Received September 15, 2020)