Contribution Title:	DECAY OF EQUILIBRIUM TIME CORRELATIONS IN A WEAKLY NONLINEAR SCHRÖDINGER EQUATION
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We report on first progress in rigorous control of a kinetic scaling limit of a weakly nonlinear perturbation of wave-type evolution, here a discrete Schrödinger equation. Since we consider a Hamiltonian system, a natural choice of random initial data is distributing them according to a Gibbs measure with a chemical potential chosen so that the Gibbs field has exponential mixing. The solution $\psi_t(x)$ of the nonlinear Schrödinger equation yields then a stochastic process stationary in $x \in \mathbb{Z}^d$ and $t \in \mathbb{R}$. If λ denotes the strength of the nonlinearity, we prove that the space-time covariance of $\psi_t(x)$ has a limit as $\lambda \to 0$ for $t = \lambda^{-2}\tau$, with τ fixed and $|\tau|$ sufficiently small. The limit agrees with the prediction from kinetic theory. The talk is based on a joint work with Herbert Spohn [J. Lukkarinen and H. Spohn, Weakly nonlinear Schrödinger equation with random initial data, preprint arXiv:0901.3283].