ESTIMATION OF PROPAGATION OF CHAOS VIA CUMULANT HIERARCHIES IN TWO EXAMPLE MODELS

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Propagation and generation of "chaos" is an important ingredient in rigorous control of applicability of kinetic theory, in general. Chaos can here be understood as sufficient statistical independence of random variables related to the "kinetic" observables of the system. Cumulant hierarchy of these random variables thus often gives a way of controlling the evolution and the degree of such independence, i.e., the amount of "chaos" in the system. In this talk, we will consider two, qualitatively different, example cases for which kinetic theory is believed to be applicable: the discrete nonlinear Schrodinger evolution (DNLS) with suitable random, spatially homogeneous initial data, and the stochastic Kac model. In both cases, we set up suitable random variables and propose methods to control the evolution of their cumulant hierarchies. The talk is based on joint work with Aleksis Vuoksenmaa, and earlier works with Matteo Marcozzi, Alessia Nota, and Herbert Spohn.