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Ornstein-Uhlenbeck limit for the velocity process of an N -particle system interacting stochastically. (English) [Zbl 1292.82026](#)

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Summary: An N -particle system with stochastic interactions is considered. Interactions are driven by a Brownian noise term and total energy conservation is imposed. The evolution of the system, in velocity space, is a diffusion on a $(3N - 1)$ -dimensional sphere with radius fixed by the total energy. In the $N \rightarrow \infty$ limit, a finite number of velocity components are shown to evolve independently and according to an Ornstein-Uhlenbeck process.

MSC:

82C22 Interacting particle systems in time-dependent statistical mechanics

Keywords:

particle in a heat bath; propagation of chaos; Kac program; stochastic interactions in many dimensions; diffusion on a sphere; Ornstein-Uhlenbeck process; Kac systems

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