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Solution of BBGKY Hierarchy of Tagged Particle in Infinite-particle System

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We consider the microscopic origin of dynamics of a tagged particle in surroundings of infinitely many particles, that modelling diffusion processes in scaling limits, in particular, systems of particles which evolution governed by the Fokker-Planck equation.

A one-dimensional system of a heavy particle interacting with infinitely many light particles as hard spheres it is described by the BBGKY hierarchy. We establish the existence and uniqueness of global solutions of this BBGKY hierarchy in the space of sequences of integrable functions and in the space of sequences of bounded functions with respect to configurational variables.