

THE BOLTZMANN–GRAD LIMIT FOR OBSERVABLES OF HARD SPHERE FLUIDS

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We develop a new formalism for the description of the kinetic evolution of a hard sphere fluids in the Boltzmann–Grad scaling limit within the framework of marginal observables [1]. For initial states specified by means of a one-particle distribution function the relations between the Boltzmann–Grad asymptotic behavior of a nonperturbative solution of the Cauchy problem of the dual BBGKY hierarchy for hard spheres and a solution of the Boltzmann kinetic equation are established.

One of the advantages of the stated approach to the derivation of kinetic equations from underlying hard sphere dynamics consists in an opportunity to construct the Boltzmann-like kinetic equation with initial correlations, in particular, that can characterize the condensed states of hard spheres. Moreover, it gives to describe the process of the propagation of initial correlations in the Boltzmann–Grad scaling limit.

1. Gerasimenko V., Gapyak I. Low-Density Asymptotic Behavior of Observables of Hard Sphere Fluids. *Advances in Mathematical Physics*, 2018, Volume 2018, Article ID 6252919, 11 p.