

ADVANCES IN KINETIC THEORY FROM BOGOLYUBOV TO NOWADAYS

V. I. Gerasimenko

Institute of Mathematics, Kyiv, Ukraine

gerasym@imath.kiev.ua

We review the progress in the problem of the rigorous description of collective behavior of many-particle systems by means of kinetic equations from the classical Bogolyubov papers to nowadays [1],[2].

Moreover, we also consider a new approach to the problem of the rigorous description of kinetic evolution by means of the marginal observables governed by the dual BBGKY hierarchy. One of the advantages of the developed approach to the derivation of kinetic equations from underlying dynamics of many particles consists in an opportunity to construct kinetic equations with initial correlations, in particular, correlations characterizing the condensed states of a system, and to describe the processes of the propagation of initial correlations in scaling limits.

1. Bogolyubov M. M. Kinetic equations. JETP, 1946, 16 (8), 691–702.
2. Bogolyubov M. M., Gurov K. P. Kinetic equations in quantum mechanics. JETP, 1947, 17 (7), 614–628.