On the consistent description of a kinetics and hydrodynamics of quantum Bose systems

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An important problem of the consistent description for the one-particle (kinetic) and collective (hydrodynamic) effects in excitation spectrum at intermediate values of a wave vector and frequency is still unresolved. In this investigation the generalized transport equations for Bose system are obtained using the method of Zubarev nonequilibrium statistical operator [1]. The time correlation functions and collective excitation spectrum with separate contributions from the kinetic and potential energies are obtained. In this way the relation between one-particle and many-particle correlations is traced. It can be actual in relationship with the studies of the kinetics of one-particle and pair-particle Bose condensates in superfluid helium [2].

References
