

## **ABSTRACT**

On the basis of the Kadanoff—Baym (KB) version of the real time-dependent Green function method, a new Ansatz for the approximation of a spectral function of one-particle energy states in the system of  $N$  interacting fermions is offered. The Ansatz possesses all the advantages of quasiparticle and extended quasiparticle approximations, and besides that satisfies the KB equation for a spectral function in the case of slightly nonequilibrium system when disturbances in space and time are taken into consideration in the gradient approximation. The kinetic equation of the Landau phenomenological theory of neutral quantum Fermi liquid and the Sum kinetic equations for the degenerate electron Fermi liquid of nonferromagnetic metals in a magnetic field are proved to be valid at nonzero temperatures. The precision of the Silin kinetic equations is determined in terms of the functions that describe the spin splitting of energy levels in the magnetic field and the inverse lifetime of quasiparticles.