

STATIC AND DYNAMIC PROPERTIES OF FERMI LIQUIDS OF CHARGED PARTICLES

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The dynamic structure factor and other dynamic characteristics of a uniform electron gas are studied using the nine-moment generalization of the self-consistent version of the method of moments (SCMM) [1] with a quantitative agreement being achieved with the numerical data obtained recently by the path-integral Monte-Carlo method [2]. This is a generalization of our five-moment classical results [1, 3] to the quantum Fermi liquids of charged particles. The advantage of the SCMM approach is that the dynamic characteristics are expressed in terms of the static ones (the static structure factor [4]) without any adjustment to the simulation data and taking the energy dissipation processes into account. The static dielectric function and other static characteristics of dense warm charged Fermi liquids were recently successfully described using the same method [5].

Preliminary results were reported at the International Conference on the Physics of Non-Ideal Plasmas in Dresden (PNP 17) earlier this year.

Perspectives of the method are outlined.

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