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Fractional exclusion statistics: the paradigm to describe interacting particle systems[1] ANGHEL DRAGOS-VICTOR, Horia Hulubei National Institute of Physics and Nuclear Engineering — The thermodynamics and statistical mechanics calculations for systems of interacting particles represent in general a difficult task. Even in relatively simple cases, like systems described in the Fermi liquid theory or in the Hartree or Hartree-Fock approximations, the dependence of the quasiparticle energies on the population of all the quasiparticle energy levels makes it impossible to apply the standard formalism. This is because either the sum of quasiparticle energies is different from the total energy of the system or the typical Bose and Fermi populations do not maximize the partition function. The solution to this problem is provided by the application of the fractional exclusion statistics. In this presentation I will compare the standard treatment of systems of interacting particles, given in terms of the Bose or Fermi populations of the quasiparticle energy levels, with a method based on the fractional exclusion statistics. This method is the only paradigm for describing rigorously the interacting particle systems in terms of quasiparticles.

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