

Spinor Fermi Gases

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Abstract

We consider an ideal gas of fermions with total angular momentum $F = 3/2$ which is either harmonically trapped or homogeneous. For a fixed magnetization, we calculate the temperature dependence of thermodynamical quantities as, for instance, the heat capacity, the chemical and the magneto-chemical potential. Afterwards, the isotropic short-range contact-interaction is treated perturbatively and its influence on the ground-state energy and other relevant thermodynamical quantities is worked out. Such spinor Fermi gases are important, for example, in the context of a ^{52}Cr - ^{53}Cr boson-fermion mixture [1].

[1] R. Chicireanu et al., Phys. Rev. A **73**, 053406 (2006).