

The Ground State Energy and One-Particle Excited States of a Finite Inhomogeneous Bose Gas

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The ground state of an inhomogeneous boson gas with zero spin is considered in the framework of the formalism of secondary quantization and within the self-consistent Hartree-Fock approximation. On this basis, a system of equations is obtained for one-particle wave functions describing the ground state of an inhomogeneous boson gas, in which one-particle states are excited. If all gas particles are in the Bose-Einstein condensate, the resulting equations correspond to the stationary Gross-Pitaevskii equation [1,2].

- [1] Bobrov V B, Zagorodny A G and Trigger S A 2018 *Low Temperature Physics* **44** 1211
- [2] Bobrov V B, Trigger S A and Zagorodny A G 2021 *Low Temperature Physics* **47** 347