

Abstract Submitted
for the TSF07 Meeting of
The American Physical Society

Fluctuations of Particle Number in Two-component Interacting Bose-Einstein Condensate. ANDRII SIZHUK, ANATOLY SVIDZINSKY, MARLAN SCULLY, Physics Department MS 4242, Texas A&M University, TX 77843 USA — We study equilibrium fluctuations of particle number in the two-component weakly interacting Bose-Einstein condensate (BEC). Using Bogoliubov theory we obtain analytical expressions for the particle distribution function and fluctuations. We discuss several particular cases, namely, zero-temperature limit and the Thomas-Fermi regime. We study in detail the vicinity of the quantum phase separation transition where fluctuations undergo dramatic variation. We plot the temperature dependence of the first central moments of the condensate distribution function for the two-component interacting BEC and compare it with the one-component condensate.

Andrii Sizhuk

Date submitted: 21 Sep 2007

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