Abstract for GR-TR Conference on Statistical Mechanics and Dynamical Systems

Topic: Other Preference: Oral

The occurrence of Bose-Einstein condensation in a low-dimensional confinement

E.O. Karabulut[1*], M. Koyuncu[1], M. Tomak[2]

[1] Selcuk University, Department of Physics, Konya, Turkey
[2] Middle East Technical University, Department of Physics, Ankara, Turkey
[*] Electronic Address: eoyildirim@selcuk.edu.tr

The possibility of Bose-Einstein Condensation (BEC) of an ideal Bose gas confined in a low-dimensional trap is investigated. The standard semi-classical approximation predicts the absence of BEC at finite temperature in such a system due to the use of the thermodynamic limit which assumes an infinite system with an infinite number of particles. However, the situation realized in atom traps is quite different where a finite number of atoms exist. Thus a quantum mechanical treatment has been adopted here to study the finite number effect on a low-dimensional system. The results obtained from this approach reveal clearly the macroscopic occupation of the ground state which can be regarded as an evidence for BEC.