On the Lee-Huang-Yang term in the energy expansion for the dilute Bose gas.

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Abstract

The ground state energy per unit volume $e(\rho)$ of a large system of interacting bosons at density ρ is expected to obey the formula

$$e(\rho) = 4\pi a\rho^2\left(1 + \frac{128}{15\sqrt{\pi}}\sqrt{\rho a^3}\right) + \text{higher order terms},$$

in the dilute limit $\rho a^3 \ll 1$. Here the correction term is known as the Lee-Huang-Yang term.

In this talk, I will review a recent proof of the lower bound corresponding to this formula which includes the important case of the hard-core interaction.

Based on joint work with Jan Philip Solovej.