Selected Abstracts from Other Physical Review Journals

Abstracts of papers that are published in other Physical Review journals and may be of interest to Physical Review A readers are printed below.

Dilute Bose gas revised. A. Yu. Cherny[1] and A. A. Shanenko[2]
[1]*Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, 141980 Dubna, Moscow Region, Russia* [2]*Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, 141980 Dubna, Moscow Region, Russia.* (Received 16 March 1999)

The well-known results concerning a dilute Bose gas with the short-range repulsive interaction should be reconsidered due to athermodynamic inconsistency of the method being basic to much of the present understanding of this subject. The aim of our paper is to propose another way of treating the dilute Bose gas with an arbitrary strong interaction. Using the reduced density matrix of the second order and a variational procedure, this way allows us to escape the inconsistency mentioned and operate with singular potentials of the Lennard-Jones type. The derived expansion of the condensate depletion in powers of the boson density $n=N/V$ reproduces the familiar result, while the expansion for the mean energy per particle is of the form $\varepsilon=2\pi\hbar^2 an/m\{1+128/(15\sqrt{\pi})\sqrt{na^3}(1-5b/8a)+\cdots\}$, where a is the scattering length and $b\geqslant 0$ stands for one more characteristic length depending on the shape of the interaction potential (in particular, for the hard spheres $a=b$). All the consideration concerns the zero temperature. [S1063-651X(99)50507-2] [Phys. Rev. E **60**, 5 (1999)]

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