Quasi-1D Bose gas revisited

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Abstract

Statistical properties of an interacting bosonic gas at nonzero temperatures in harmonic potential are studied using a classical field approximation. This way we obtain not only the depletion of the condensate with growing temperature but also coherence properties and density fluctuation of the system. We show very good agreement of the last one with the experiment[4]. We study in detail the effect of quasi-condensation. We show that this phenomenon is strictly related to the dimensionality of the system. It is present in one dimensional systems independently of interaction - exists in repulsive, attractive or in noninteracting Bose gas in some range of temperatures.

References

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