Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Using modified Gaussian distribution to study the physical properties of one and two-component ultracold atoms[1] CHOU-CHUN HUANG, WEN-CHIN WU, National Taiwan Normal University — Gaussian distribution is commonly used as a good approximation to study the trapped one-component Bose-condensed atoms with relatively small nonlinear effect. It is not adequate in dealing with the one-component system of large nonlinear effect, nor the two-component system where phase separation exists. We propose a modified Gaussian distribution which is more effective when dealing with the one-component system with relatively large nonlinear terms as well as the two-component system. The modified Gaussian is also used to study the breathing modes of the two-component system, which shows a drastic change in the mode dispersion at the occurrence of the phase separation. The results obtained are in agreement with other numerical results.

[1]Financial support from the National Science Council of Taiwan

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Date submitted: 20 Nov 2006 Electronic form version 1.4