

Effects of Spatial Noncommutativity on Energy Spectrum of a Trapped Bose-Einstein Condensate

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Abstract: In noncommutative space, we examine the problem of a noninteracting and harmonically trapped Bose-Einstein condensate, and derive a simple analytic expression for the effect of spatial noncommutativity on energy spectrum of the condensate. It indicates that the ground-state energy incorporating the spatial noncommutativity is reduced to a lower level, which depends upon the noncommutativity parameter θ . The gap between the noncommutative space and commutative one for the ground-state level of the condensate should be a signal of spatial noncommutativity.

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Key words: spatial noncommutativity, energy spectrum, Bose-Einstein condensate

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