

Abstract Submitted
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Classical fields and quantum measurement for Bose-Einstein condensate KAZIMIERZ RZAZEWSKI, TOMASZ GORSKI, Center for Theoretical Physics, Polish Academy of Sciences — We analyze a process of splitting of the Bose-Einstein condensate and the mutual coherence of two separated atomic clouds. Of interest is a statistics of the population difference between the two wells. Within the classical fields approximation we show that coherence between clouds is degraded if atoms interact and if we account for the sufficiently long observation time. We also show, that upon recombination, the coherence across the sample is restored. The coherence is not fully degraded if the splitting potential remains sufficiently penetrable. We calculate the variance of atom number difference for this time-averaging measurement and show that for low temperatures it can be well below Poissonian limit like it was observed in the experiments.

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