Abstract Submitted
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Optimizing a trapped atom interferometer[1] J. GROND, U. HOHENESTER, Institute of physics, University of Graz, J. SCHMIEDMAYER, Atominstitut, TU-Wien — Interferometery with trapped Bose-Einstein condensates (BECs) offers new prospects for precision measurements. We analyse the limits of atom interferometry with split trapped BECs. The atom-atom interactions during the waiting stage (phase accumulation stage) of the interferometer limit the phase sensitivity. Number squeezing reduces phase diffusion in split Bose-Einstein condensates, phase squeezing would enhance the readout. We will discuss how to optimize the performance of a trapped atom interferometer and describe how to create the desired input states to optimize the phase sensitivity. These states can be prepared applying optimal control theory. To properly account for the many-body dynamics we perform calculations within the multi-configurational time dependent Hartree for Bosons (MCTDHB) method.

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