Towards a BEC in a time-averaged adiabatic potential ring waveguide

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Guided matter-wave experiments have become a testbed for fundamental quantum physics while at the same time pushing the limits of interferometry through development of new quantum sensors for precision measurements. For instance, confinement and coherent control of a Bose-Einstein condensate (BEC) in a ring-shaped potential would pave the way to what will probably be the most sensitive Sagnac-type interferometer to date.

A favorable route towards this goal are time-averaged adiabatic potentials (TAAP) [1], which allow flexible and smooth shaping of the potential, including a ring, and promise coherent manipulation of BEC.

Here we introduce a simple scheme for loading a sample of cold atoms onto the ring and present preliminary results on the RF dressing required for the TAAP.

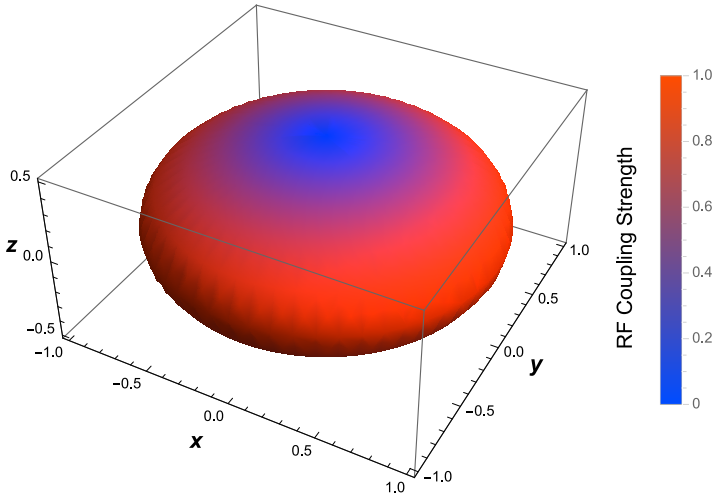

Figure 1: *Exact calculation of the normalized coupling strength of a linear RF dressing field in the vertical direction of a quadrupole trap.*

References

[1] I. Lesanovsky, W. von Klitzing Phys. Rev. Lett. **99**, 083001 (2007)