



LENS-QSTAR Seminar
July 4, 2014 at 9:30
Dipartimento di Fisica e Astronomia, Arcetri (L.go E. Fermi 2, Firenze)
Aula A

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Realization of a trapped atom interferometer using BECs with tunable interactions

We present an innovative experimental apparatus for the realization of a Mach-Zender interferometer with BECs in a double well trapping potential. We employ 39K atoms to tune the atomic interaction strength exploiting a broad magnetic Feshbach resonance [1]. Tuning interactions close to zero allows to achieve coherence times of the interferometer of several hundreds of milliseconds. In addition the high stability of our trapping potential allows to observe the coherent oscillations of the condensate between the two spatial modes. We finally discuss the possibility of using interactions to produce entangled states that offer sensitivities beyond the Standard Quantum Limit [2].

[1] Phys. Rev. Lett. 99, 010403 (2007)

[2] Science 306, 1330 (2004)

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