ID de Contribution: **20** Type: **Invited talk**

Atom interferometry with ultra-cold strontium atoms

mercredi 24 février 2016 15:00 (30 minutes)

In this talk I'll present the most recent results on a large momentum transfer (LMT) Mach-Zehnder atom interferometer with ultra-cold strontium atoms [Mazzoni2015].

LMT Bragg diffraction pulses (up to eight photon recoils) are applied to atoms in free fall, launched upward with an accelerated lattice. We then use the strontium interferometer as a gravimeter, demonstrating best sensitivity of dg/g=4×10^-8.

Thanks to the special characteristics of strontium atoms for precision measurements [Poli2011], this result introduces new possibilities for experiments in fundamental and applied physics, as high precision measurements of gravity and gravity gradients, and precision test of Einstein Equivalence principle [Tarallo2014].

Ref.

[Poli2011] N. Poli, F.-Y. Wang, M. G. Tarallo, A. Alberti, M. Prevedelli, G. M. Tino "Precision measurement of gravity with cold atoms in an optical lattice and comparison with a classical gravimeter", Phys. Rev. Lett. 106, 038501 (2011)

[Tarallo2014] M. G. Tarallo, T. Mazzoni, N. Poli, D. V. Sutyrin, X. Zhang, and G. M. Tino, "Test of Einstein Equivalence Principle for 0-spin and half-integer-spin atoms: Search for spin-gravity coupling effects", Phys. Rev. Lett. 113, 023005 (2014)

[Mazzoni2015] T. Mazzoni, X. Zhang, R. Del Aguila, L. Salvi, N. Poli, and G. M. Tino "Large-momentum-transfer Bragg interferometer with strontium atoms", Phys. Rev. A 92, 053619 (2015)

Auteur principal: Dr POLI, Nicola (Dipartimento di Fisica e Astronomia & LENS - Univ. Firenze)

Orateur: Dr POLI, Nicola (Dipartimento di Fisica e Astronomia & LENS - Univ. Firenze)

Classification de Session: Session 6