



UNITÉ MIXTE DE RECHERCHE UMR 8552



Post-Doctoral position

Precise determination of the fine structure constant α for the new International System of units

The fine structure constant α has a particular role among fundamental constants. Its precise determination leads to the most stringent test of quantum electrodynamics. Moreover nowadays α is a cornerstone of the redefinition of the International System of Units (SI) which will rely on the values of fundamental constants. This redefinition is foreseen in 2018.

The objective of our team is the determination of the fine structure constant with a relative uncertainty at the level of 10^{-10} . The value of α will be deduced from the measurement of the recoil velocity obtained by combining atom interferometry with Bloch oscillations in an accelerated optical lattice.

The selected candidate will work on an existing experiment, which has been continuously improved in recent years. The goal will then be to perform a new determination of the fine structure constant with higher accuracy in comparison with our previous work published in 2011 (see Bouchendir et al. *Phys. Rev. Lett.* **106**, 080801 (2011)). This new value should be taken into account by the CODATA to set the recommended value that will be used for the redefinition of the SI. To achieve such a level of accuracy we will address several challenging tasks such as understanding the physical origin of the systematic effect linked to optical lattice intensity or controlling the Gouy phase and the wavefront curvature of the laser beams.

Skills of the applicant

We are looking for outstanding candidates, preferably with experience in any of the following fields: ultra-cold atoms; atom interferometry; quantum optics, quantum metrology. Fluent in English, knowledge of French would be an asset. Used to autonomous work as well as part of a team, with analytical and interdisciplinary thinking.

The position is based on a full-time employment at laboratoire Kastler Brossel. The interested candidate should address a CV and a motivation letter to Saida Guellati (<mailto:saida.guellati@lkb.upmc.fr>)

Application deadline: September 30, 2016

Job starting date : as soon as possible