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Precise determination of the fine structure constant and test of quantum electrodynamics

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In our experiment the fine structure constant is deduced from the measurement of the recoil velocity of an atom when it absorbs a photon. Such a measurement is performed by combining a Ramsey-Bord\'e atom interferometer with
Bloch oscillations. We obtain a value of α with a relative uncertainty of
6.6×10^{-10}\cite{Bouchendira}. Using this value of α, we obtain a theoretical value of the electron magnetic moment in agreement with the experimental measurement of
Harvard's group. The comparison of these values provides the most
stringent test of QED. Moreover, the uncertainty is small enough
to verify for the first time the muonic and hadronic contributions
to the electron magnetic moment.

In this talk we will discuss the latest developments of this experiment.

Author: Prof. GUELLATI-KHÉLIFA, Saida (Laboratoire Kastler Brossel)

Presenter: Prof. GUELLATI-KHÉLIFA, Saida (Laboratoire Kastler Brossel)