

CEA - Saclay 91191 Gif-sur-yvette Cedex
Service de Physique de l'Etat Condensé
SÉMINAIRE

Mercredi 24 février 11h15

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Miniaturizing optical cavity QED

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Second-long coherence times are a hallmark of laser-cooled atoms, and can be achieved both with single atoms and with ensembles. Applications based on this coherence include atomic clocks and atom interferometry. Combining it with efficient single-atom preparation and detection methods may enable quantum engineering in a style similar to ion traps, while maintaining the simplicity of a neutral-atom experiment. A particularly attractive platform for such developments are miniature atom traps on chips, called "atom chips".

We have developed such methods using a novel fiber Fabry-Perot cavity on an atom chip, which works in the strong coupling regime of cavity quantum electrodynamics (CQED). This has enabled us to observe CQED effects with atomic Bose-Einstein condensates, and to optically detect single atoms with a back-action of less than one spontaneous photon - a result that is impossible to achieve with free-space optical interaction.

Un café sera servi à 11h00.

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