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

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Mercredi 7 septembre 11h15

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Mechanical squeezing using parametric amplification, weak measurement and feedback

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In recent years there has been much interest in cooling mechanical oscillators down to absolute zero using either optical or microwave fields. One goal of this field is to develop the capability to prepare a range of non-classical states of motion of such oscillators, but the experimental requirements for this remain formidable. One approach is to use nonlinear forces to squeeze the motion of a mechanical oscillator below the zero-point and of existing methods, mechanical parametric amplification is relatively accessible, but previously thought to provide only very limited squeezing in the steady state. In opto-mechanical systems, combining such mechanical non-linearities with continuous measurement and feedback is one avenue to improving control over the quantum state of mechanical oscillators. In this talk I will discuss the state of the art in opto-mechanical systems and illustrate the possibilities for measurement and feedback by describing a theoretical scheme that in principle allows unlimited steady-state squeezing while being very robust to thermal noise and detection inefficiency.

A coffee break will be served at 11h00. The seminar will be given in English.
