

Cold-atom induced control of an opto-mechanical device

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We consider an optical cavity with a light vibrating end-mirror and containing a Bose-Einstein condensate (BEC). The mediation of the cavity field induces a non-trivial interplay between the mirror and the collective oscillations of the intra-cavity atomic density. We explore the thermodynamical implications of this dynamics and highlight the possibilities for indirect diagnostic. The effects we discuss can be observed in a set-up that is well within reach of current experimental capabilities and is central in the quest for mesoscopic quantumness.

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