
Hybrid nano-optomechanics: a single NV defect coupled to a nanomechanical oscillator

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Résumé

I will describe our experiments aiming at coupling the spin state of a single NV defect to the vibrations of a nano-mechanical oscillator. In particular I will present the self synchronization of the spin state on the mechanical motion when properly dressed with a resonant MW field. This signature is equivalent to a phononic Mollow triplet for the spin-oscillator system in parametric interaction. Then I will present the optical readout techniques we have developed to probe the nanomotion of our nanoresonators. We have imaged the non conservative topology of the optomechanical interaction force field and observed a new regime of strong coupling between the nanoresonator eigenmodes.

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