

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 02 June 2016

17:00 -18:00

3rd Floor Seminar Room

"Non-Markovian quantum dynamics in the strong-coupling limit of cavity QED"

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Abstract

Among different hybrid quantum systems, the ones based on spin ensembles coupled to superconducting microwave cavities have recently attracted much attention. I will speak about the dynamics of an ensemble of negatively charged NV centers in diamond with a strong magnetic coupling to a superconducting coplanar single-mode waveguide resonator. Based on our theory we predict and experimentally observe for the first time [1], how the decoherence induced by the inhomogeneous distribution of these NV centers can be suppressed in the strong-coupling regime - a phenomenon known as "cavity protection". In another study, we could recently find an alternative way to overcome the detrimental influence of inhomogeneous broadening by burning two narrow spectral holes in the spin spectral density at judiciously chosen frequencies [2,3]. Furthermore, we demonstrate that engineering the spin spectral density to acquire a comb-like structure leads to coherent revival dynamics with exciting potential for the processing of quantum information.

[1] S. Putz, D.O. Krimer, R. Amsüss, A. Valookaran, T. Nöbauer, J. Schmiedmayer, S. Rotter, and J. Majer, *Nature Physics* 10, 720 (2014).

[2] D.O. Krimer, B. Hartl, and S. Rotter, *Phys. Rev. Lett.* 115, 033601 (2015).

[3] S. Putz, A. Angerer, D.O. Krimer, R. Glattauer, W. J. Munro, S. Rotter, J. Schmiedmayer, and J. Majer, arXiv:1512.00248 (2015)