



华侨大学系统科学研究所

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学术报告

Nonclassical Quantum Optical phenomena in the presence of artificial metamaterials

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报告摘要:

The advent of metamaterials and recent advantages in nanofabrication have provided a well-established platform to realize different Quantum Optical processes. In this lecture, both the two-dimensional graphene and the effective zero-index-metamaterial structures have been introduced. Their inherent natures allow peculiar light-matter couplings, which mainly originates from the surface plasmon modes exist near surfaces. It is shown that the Purcell factor of a quantum emitter interacting with a single graphene sheet can be tuned on the spot by applying an electric bias, thus enabling the control over the steady state properties and the squeezing in the resonance fluorescence. In the structure contains both the perfectly paired single-negative slabs and the atom pairs, the results demonstrate that the collective dynamics and the entanglement for the atomic subsystem strongly depend on the surface response at the resonance frequency of the emitters.

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