Contribution ID: **34** Type: **Poster**

Light-matter interactions in the vacuum of ultra-strongly coupled systems

Tuesday, 7 May 2024 17:30 (1h 30m)

We theoretically study how the peculiar properties of the vacuum state of an ultra-strongly coupled system can affect basic light-matter interaction processes. In this unconventional electromagnetic environment, an additional emitter no longer couples to the bare cavity photons, but rather to the polariton modes emerging from the ultra-strong coupling, and the effective light-matter interaction strength is sensitive to the properties of the distorted vacuum state. Different interpretations of our predictions in terms of modified quantum fluctuations in the vacuum state and of radiative reaction in classical electromagnetism are critically discussed. Whereas our discussion is focused on the experimentally most relevant case of intersubband polaritons in semiconductor devices, our framework is fully general and applies to generic material systems.

Abstract category

Quantum Optics

Primary author: Dr DE BERNARDIS, Daniele (Ino-cnr)

Presenter: Dr DE BERNARDIS, Daniele (Ino-cnr)

Session Classification: Poster session