

Cavity Quantum Electro-optics

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The quantum dynamics of the coupling between a cavity optical field and a resonator microwave field via the electro-optic effect is studied. This coupling has the same form as the opto-mechanical coupling via radiation pressure, so all previously considered opto-mechanical effects can in principle be observed in electro-optic systems as well. In particular, I point out the possibilities of laser cooling of the microwave mode, entanglement between the optical mode and the microwave mode via electro-optic parametric amplification, and back-action-evading optical measurements of a microwave quadrature.

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