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Dynamics of strongly coupled harmonic oscillators in Gaussian noisy channels

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We investigate the Markovian evolution of Gaussian entanglement and steering in a system consisting of two strongly coupled harmonic oscillators immersed in a structured environment. Specically, we analyze the contribution of the interaction between modes when the magnitude of the intermode coupling strength is comparable to the local frequencies of the modes, and the rotating wave approximation does not apply. Previously, the intermode strong coupling was considered in the case of a common thermal bath [1], and presently we extend this investigation to a generalized Gaussian channel, when the environment is modeled by a collection of squeezed bosonic modes. We also provide an extended comparison of the evolution of entanglement and steering in weak and strong coupling regimes [2].

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