

# Environment-assisted generation of quantum correlations in open quantum systems

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Hellinger geometric quantum discord and interferometric power are analyzed for an open system consisting of two bosonic modes, while interacting with four different environments: vacuum, squeezed vacuum, thermal and squeezed thermal, taking the initial state of the open system to be either a singlemode squeezed state, which presents no initial correlations or a squeezed vacuum state. The description of the evolution of the correlations is formulated in the framework of the theory of open systems, based on completely positive quantum dynamical semigroups, using the Gorini-Kossakowski-Lindblad-Sudarshan equation. We showed that both quantum correlations can be generated from an initial factorized state and even amplified, while also studying the back and forth impact of the squeezing parameters on the considered correlations. For certain environments, the difference between the squeezing of the initial state and the squeezing of the environment can either destroy the correlations or enhance them. We also studied the presence of decoherence free states (DFS) if initial parameters are chosen suitably.

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