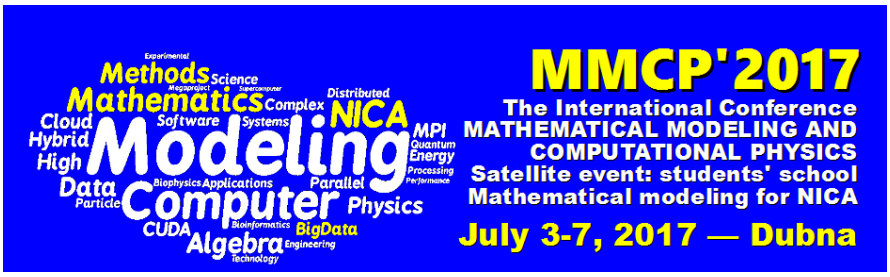

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Dynamics of quantum correlations in bipartite Gaussian open quantum systems

Thursday 6 July 2017 08:00 (30 minutes)

In the framework of the theory of open systems based on completely positive quantum dynamical semigroups, we make a comparison of the behaviour of continuous variable quantum correlations (quantum entanglement, entropic quantum discord, geometric quantum discord, quantum steering) for a system consisting of: 1) two non-coupled; 2) two coupled bosonic modes embedded in a common environment of the form of a thermal bath or of a squeezed thermal bath. We solve the Markovian master equation for the time evolution of the considered system and describe the quantum correlations in terms of the covariance matrix for Gaussian input states. Depending on the values of the parameters characterizing the initial state of the system (squeezing parameter, average photon numbers), the coefficients describing the interaction of the system with the reservoir (temperature, dissipation constant), and on the intensity of the interaction between the two modes, one may notice phenomena like generation of quantum correlations, their suppression (sudden death), periodic revivals and suppressions, or an asymptotic decay in time of quantum correlations.

Primary author: Prof. ISAR, Aurelian (National Institute of Physics and Nuclear Engineering, Bucharest--Magurele, Romania)

Presenter: Prof. ISAR, Aurelian (National Institute of Physics and Nuclear Engineering, Bucharest-Magurele, Romania)

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