Entanglement and Shot Noise in a two-qubit c-QED\textsuperscript{1} L.D. CONTRERAS-PULIDO, Instituto de Ciencia de Materiales de Madrid-CSIC, C. EMARY, T. BRANDES, Technische Universitaet Berlin, R. AGUADO, Instituto de Ciencia de Materiales de Madrid-CSIC — It has been proved in the last few years that circuit quantum electrodynamics (c-QED) is a promising architecture for quantum information processing and quantum computation realizations [1]. We theoretically study a c-QED system consisting of two charge-qubits (defined in two Cooper-Pair boxes) coupled to a common bosonic mode (photon, phonon) inside a transmission line cavity. In particular, we analyze a transport setup in which each qubit is attached to a drain electrode such that the Josephson Quasiparticle cycle induces an electrical current flow across them [2]. By means of a Quantum Master Equation approach, shot noise cross-correlations of the electrical current are studied and their remarkable behavior is related with the degree of entanglement induced between the qubits by the coupling with the boson mode.


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