Abstract Submitted
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Theoretical and Experimental Studies of Circuit QED Systems (Part I)[1] MATTEO MARIANTONI, FRANK DEPPE, Walther-Meissner-Institute, TU of Munich, Germany, RUDOLF GROSS, Walther-Meissner-Institut, TU of Munich, Germany — The formalism of circuit QED explains the coupling between a superconducting qubit (charge or flux) and a microwave resonator. Instead of focusing on the well-known resonant and dispersive regimes, we investigate a deeply dispersive regime, where qubit and resonator are strongly detuned and the transition frequency of the resonator is almost negligible compared to the qubit one. This regime has been exploited experimentally in several different implementations, e.g., the reading-out of a superconducting qubit by means of a low frequency resonator. In this framework, we have developed a simple formalism which encompasses the many explanations given in the literature on the experiments mentioned above. Furthermore, our results shed new light on decoherence studies of dephasing mechanisms due to low frequency noise as well as photon noise.

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