

Abstract Submitted
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Noise in a Josephson junction qubit due to two-level-systems coupled to a quantum EM field¹ VICTOR GALITSKI, SO TAKEI, University of Maryland College Park — We theoretically study loss of the dielectric film located within an LC resonator circuit due to two-level defects (TLDs). We present a fully quantum mechanical treatment of the full system in which the TLDs couple to a quantized harmonic oscillator, which models the resonator, and to quantized bosonic fields that describe the feedline used to pump and probe the resonator. We focus on the forward transmission as a function of the microwave pump frequency, and investigate how the fluctuating defects affect the noise spectrum of the transmitted voltage signal. Our quantum mechanical treatment makes connections to experiments conducted down to energies where a single photon is stored in the resonator.

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