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Internal loss of superconducting resonators induced by interacting two level systems¹ LARA FAORO, LPTHE, CNRS, LEV IOFFE, Rutgers University — In a number of recent experiments with microwave superconducting resonators the anomalously slow dependence of the quality factor on the power was observed. This observation implies that the monochromatic radiation does not saturate two level systems in the surrounding oxides as predicted by the standard model of two-level systems (TLS). We argue that these observations suggest the importance of interactions between TLS in these materials. We show that interactions between TLS lead to a drift of their energies that result in much slower, logarithmic dependence of their absorption on the radiation power in a reasonable agreement with the data.

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Lev Ioffe
ioffe@physics.rutgers.edu
Rutgers University

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