

Abstract Submitted
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Harmonic and Intermodulation Distortion in a Superconducting Microwave Resonator¹ BRADLEY DOBER, University of Wisconsin, Madison, STEPHEN REMILLARD, Hope College — Experiments on the response of a thin film high temperature superconducting resonator to microwave stimulus have revealed a measurable amount of nonlinearity characterized by both second and third order distortion, as well as current dependant surface impedance. The power law dependence of the surface impedance was determined for both its real and imaginary parts. The 3rd order intermodulation distortion (IMD) was measured in the same regime and found to have a somewhat weaker than cubic power law dependence on source power, P . However, due to the nonlinearity, the power that is actually introduced into the resonator, also depends on P , and when this is accounted for, it is found that the IMD power depends on the cube of the power inside the resonator. 2nd and 3rd order harmonic emission is also generated by this resonator, providing evidence of time reversal symmetry breaking nonlinearity. The currents associated with 2nd and 3rd order harmonic generation were found to exist in different locations on the microstrip resonator.

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