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Stimulated microwave photon transfer through dielectric two-level systems YANIV ROSEN, Laboratory for Physical Sciences, College Park, MD, MOE KHALIL, Laboratory for Physical Sciences, College Park, MD and University of Maryland, College Park, MD, KEVIN OSBORN, Laboratory for Physical Sciences, College Park, MD — Two level systems (TLS) in dielectrics are a major source of energy loss for superconducting circuits at milli-kelvin temperatures. We will show measurements taken with a bias-bridge resonator circuit, which allows the simultaneous application of an electric dc field, while measuring the loss tangent of applied microwave fields. Previous measurements with this device show that 10^9 TLS can be tuned through the microwave resonance and the loss of these can be changed due to rapid passage of the TLS. We extend these studies by concurrently applying multiple microwave frequencies, and explore the possible transfer of photons from one frequency to the other using stimulated processes with the TLS and resonator fields. These experiments show that the background of disordered TLS, usually thought of as deleterious, may be controlled in potentially useful ways.

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