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Effects of vortices trapped in superconducting microwave resonators IBRAHIM NSANZINEZA, B.L.T. PLOURDE, Syracuse University — The microwave response of superconductors can be influenced by the presence of vortices and the dynamics they exhibit at high frequencies. We present measurements of vortices trapped in coplanar waveguide superconducting resonators fabricated from thin aluminum films, a common material for superconducting qubit circuits. In particular, by adjusting the geometry of our resonators we are able to trap only a few vortices in certain regions of the resonators. We perform field-cooled measurements to study the dependence of the microwave vortex response on magnetic field and frequency for various resonator modes. In most cases, the addition of vortices results in a downward shift in resonant frequency and a reduction in the quality factor. However, under certain circumstances, the presence of trapped vortices can actually lead to an enhancement of the resonator quality factor.

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