



this article the K value is nearly an order of magnitude greater, as discussed in the following.

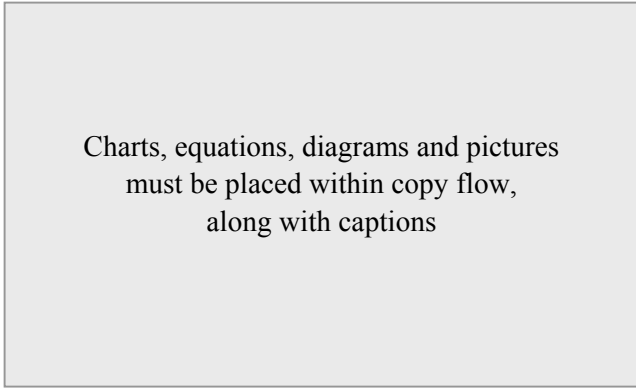


Figure 2: Schematic view of the niobium-on-ferrite microstrip resonator.

Experimental devices

We report here the first experiments to obtain wide tunability and high Q using superconducting resonators coupled to polycrystalline garnet ferrite substrates (Trans Tech G121 O). We have exploited the magnetic-field-dependent permeability $\mu(H)$ of the

ferrite. These substrates have low loss at microwave frequencies, and we have previously demonstrated [5] that, by preventing penetration of the superconductor by the dc magnetic flux in the ferrite, ferrite/superconductor devices can preserve the low losses of superconductors yet allow interaction of the rf fields with the ferrite. In this work, two different devices were studied. The first is a YBCO microstrip on LaAlOs that is clamped to the polycrystalline ferrite substrate. The YBCO was deposited on both sides of the LaAlOg and includes a ground plane. Figure I shows the YBCO resonator. This arrangement is necessary because at the present time it is not possible to deposit YBCO directly onto polycrystalline ferrite. To obtain the ordered growth required for good superconducting properties it must be grown epitaxially on a lattice matched substrate such as LaA103. Placing the ferrite in intimate contact with the YBCO stripline allows the Strong interaction of the rf magnetic fields of the superconductor with the magnetization of the ferrite and thus allows sufficient tuning.