Abstracts

Propagation Characteristics of Inductively-Coupled Superconducting Microstrip

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The propagation properties of two inductively coupled superconducting transmission lines have been studied. An expression for the attenuation of the coupled-line modes was derived for the case of low loss. It was found that, for transmission line geometries of practical interest, the low loss expression agrees well with the more general numerical solution. The numerical solution was used to determine the dispersion characteristics of inductively coupled lines as a function of the superconductor thicknesses and the operating temperature. A lumped-element equivalent circuit, with the same dispersion equation, is presented along with the relationship between the lumped-element values and the physical parameters of the line. Prototype circuit elements such as 20 dB couplers have been designed.

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