Abstracts

Broad-Band RF Match to a Millimeter-Wave SIS Quasi-Particle Mixer

A.V. Raisanen, W.R. McGrath, P.L. Richards and F.L. Lloyd. "Broad-Band RF Match to a Millimeter-Wave SIS Quasi-Particle Mixer." 1985 Transactions on Microwave Theory and Techniques 33.12 (Dec. 1985 [T-MTT] (1985 Symposium Issue)): 1495-1500.

An integrated superconducting microstrip is shown to be a convenient, flexible, and well-characterized matching element for a super-conductor-insulator- superconductor (S1S) quasi-particle heterodyne mixer. The resonant interaction (Fiske modes) between the Josephson oscillations of a voltage-biased junction and the microstrip provides a convenient method for determining the electrical length of the microstrip line. An open-circuited microstrip stub that reflects a parallel inductance across the junction is used to broaden the bandwidth of the RF match of a 36-40-GHz S1S- mixer. Measurements with Pb-alloy junctions in a full-height waveguide mixer with fixed mechanical tuning give an instantaneous bandwidth of '10 to 15 percent with a mixer noise temperature T /sub M/ (DSB) = 10± 2.5 K.

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