Abstracts

Phase Noise Analysis of the Sapphire Loaded Superconducting Niobium Cavity Oscillator (Short Papers)

M.E. Tobar and D.G. Blair. "Phase Noise Analysis of the Sapphire Loaded Superconducting Niobium Cavity Oscillator (Short Papers)." 1994 Transactions on Microwave Theory and Techniques 42.2 (Feb. 1994 [T-MTT]): 344-347.

Measured phase noise of two GaAs FET amplifiers and a varactor phase shifter at 9.7 GHz reveal that optimum bias conditions change when cooling from room to liquid helium temperatures. This understanding enables optimisation of the electronic noise in an all cryogenic tunable sapphire loaded superconducting cavity (SLOSC) X-Band loop oscillator. The measured phase noise was limited by vibrations of the tuning mechanism. In a fixed frequency SLOSC oscillator the phase noise was limited by the amplifier noise, and has been measured to be -140 dBc/Hz at 1 kHz from the unfiltered port of the loop oscillator. Comparison of component and oscillator phase noise allows us to calculate the phase noise at the filtered port to be -175 dBc/Hz at 1 kHz offset.

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