Abstracts

Nonlinear Theory of Parametric Oscillator: Steady-State Operation and Fluctuation Analysis

R. Cazzola, G.P. Poncino, E. Bava, A. Godone and G.P. Bava. "Nonlinear Theory of Parametric Oscillator: Steady-State Operation and Fluctuation Analysis." 1983 Transactions on Microwave Theory and Techniques 31.10 (Oct. 1983 [T-MTT]): 797-805.

Parametric oscillators with a superconducting output cavity are of great interest as sources of very high frequency stability. In this paper, a careful analysis is performed for a parametric oscillator model based on an abrupt junction varactor with fixed-bias voltage and ideal shunt mode operation. Steady-state operation, transfer functions for amplitude and phase fluctuations, and additive noise contributions are examined. An overall estimation of system performance as regards to the phase instabilities shows that although the foreseen characteristics are Iess outstanding than expected from a previously reported analysis, this device compares favorably with the most important available sources based on atomic transitions or on superconducting cavity-stabilized oscillators.

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