Abstracts

A Microwave Correlator Employing YIG Delay Lines

S.F. Payer, R.A. Moore and P.H. Pincoffs. "A Microwave Correlator Employing YIG Delay Lines." 1970 Transactions on Microwave Theory and Techniques 18.8 (Aug. 1970 [T-MTT]): 426-432.

A device is described which performs the operation of correlation at microwave frequencies (L-band). Signal delay is provided by two transmission mode yttrium-iron-garnet delay lines magnetically biased for magnetoelastic wave propagation. Variation of delay is effected by electronically changing the magnetic bias on each delay line. Because group and phase delay are different functions of applied magnetic field, the autocorrelation function obtained for band-limited signals exhibits a sidelobe structure dependent on group delay variation and a fine structure which depends on phase delay variation. Calculations and experimental results are given for a sinusoidally frequency-modulated signal of large modulation index. This signal has a power spectrum with sharply defined frequency limits, easily variable bandwidth, and provides an autocorrelation function with a zero-order Bessel function amplitude variation.

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