Abstracts

Temporal Instabilities in Traveling-Wave Parametric Amplifiers (Correspondence)

E.S. Cassedy. "Temporal Instabilities in Traveling-Wave Parametric Amplifiers (Correspondence)." 1962 Transactions on Microwave Theory and Techniques 10.1 (Jan. 1962 [T-MTT]): 86-87.

The basic traveling-wave parametric amplifier (TWPA), as here defined, consists of an all-pass uniform transmission-line structure in which the distributed circuit elements are modulated in time and space by a progressive pumping wave. TWPA's, in general, have aroused great interest due to the possibilities of wide-band amplification, as predicted by coupled mode theory. It is the purpose of this communication to show that temporal instabilities exists on the basic TWPA (or its dual) when the frequency relations are of the negative-resistance type (the inverting modulator of Manley and Rowe). It is found, from the exact solution for time harmonic waves existing on this line, that under these conditions waves growing in time are present, rather than waves growing in distance along the line.

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