Abstracts

Some Properties of Three Coupled Waves

The paper deals with the problem of three waves, 1, 2, and 3, in which waves 2 and 3 are coupled to wave 1 but not to each other. The general solution for the amplitudes of the waves is given in closed form. It is shown that for certain values of the parameters growing waves can exist. Numerical solutions for the location of the boundaries of the growing wave regions are plotted. It is shown furthermore that under certain conditions the power can be completely transferred from wave 1 to waves 2 and 3. Examples on traveling-wave tubes, waveguide couplers, and backward-wave oscillators illustrate the applicability of the theory.

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