Abstracts

A Method of Forming a Broad-Band Microwave Frequency Spectrum

R.E. Wall, Jr. and A.E. Harrison. "A Method of Forming a Broad-Band Microwave Frequency Spectrum." 1955 Transactions on Microwave Theory and Techniques 3.1 (Jan. 1955 [T-MTT]): 4-9.

A method of generating a wide spectrum of evenly spaced sidebands in the microwave region, suitable for use as a frequency standard, is presented and discussed. The frequency spectrum is produced by modulating the beam acceleration voltage of a klystron with two high-frequency voltages. The frequency of one of these modulation voltages is an integral multiple of the frequency of the other voltage, so that certain sidebands of the lower frequency coincide with the sidebands of the higher frequency. The output of the klystron then consists of a frequency spectrum about the microwave carrier frequency with the spacing between sidebands equal to the lowest of the two modulating frequencies. The method is examined analytically and experimentally. The operation of a klystron is ordinarily expressed with time as the variable. An analysis making use of the Laplace transform to convert the function of time into a function of frequency has been found convenient. The result gives the magnitude of the sidebands as a function of the operating parameters of the klystron.

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