Abstracts

A High-Precision Wideband Wavemeter for Millimeter Waves (Correspondence)

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The purpose of this correspondence is to describe a high-precision wideband wave-meter for millimeter waves. At longer wavelengths usually tunable cylindrical cavities are used, which are half a guide wavelength long. Going down to millimeter waves two disadvantages arise. One is the low Q factor as the result of increasing wall losses and the other is the low accuracy of measurements as the result of the smaller dimensions of the cavity. Both disadvantages can be overcome by a cavity of larger volume. The Q factor increases with the volume, and the accuracy is proportional to the length of the cavity. That means that the cavity is several or many wavelengths long and a mode of higher axial order (H/sub01n/° with n>1) must be used. But then the problem arises that n has to be known for the determination of frequency. This can be achieved using two cavities of equal diameter but different lengths l/sub 1/ and l/sub 2/ which are independently coupled to the same waveguide.

❑ Return to main document.