Abstracts

Permittivity Measurements of Lossy Liquids at Millimeter-Wave Frequencies (Short Papers)

L. Zanforlin. "Permittivity Measurements of Lossy Liquids at Millimeter-Wave Frequencies (Short Papers)." 1983 Transactions on Microwave Theory and Techniques 31.5 (May 1983 [T-MTT]): 417-419.

A measurement system is described which allows the determination of the complex permittivity of high-loss liquids at millimeter waves. Basically, the setup consists of a waveguide interferometer whose unknown arm embodies a liquid holder irradiated by an open-ended rectangular waveguide. The sample thickness is varied by means of a piston driven by a micrometer screw. The bridge output then is read as a function of the liquid thickness. Best fitting between experimental and computed data through a suitable model of the system enables the permittivity to be determined. The system can operate, with high sensitivity, over the whole frequency range of the dominant mode propagating in the waveguide setup employed. System performance is described through a set of experimental results obtained on ethanol, methanol, and pure water at 20° C and 70 GHz.

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