Abstracts

Measurement of the Dielectric Properties of Biological Substances Using an Improved Open-Ended Coaxial Line Resonator Method

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An improved open-ended coaxial line resonator method for measuring the complex permittivity of biological substances is presented. By considering the end radiation losses and higher order mode effects, the upper frequency limit is extended from 4 GHz to 11 GHz. A novel lambda/4 open-ended coaxial line resonator, which uses a thin copper diaphragm for a coupling structure, was developed. Experiments show that the structure is very flexible, convenient, and reliable. Experimental results for several canine organs as well as human skin are given. The method has useful applications to microwave medicine and bioelectromagnetic studies.

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