Abstracts

Complex dielectric measurements and analysis of brain tissues in the radio and microwave frequencies

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We present in-vitro complex dielectric measurements of gray and white matter of rat brains in the frequency range between 45 MHz and 26.5 GHz at body and room temperatures using the open-ended coaxial probe technique with an HP8510B network analyzer. The measurement data exhibited two separated dispersions, and were analyzed by means of a complex nonlinear least-squares technique. We suggest two empirical models to describe the experimental data: one containing two Cole-Cole functions was applied to the data from this paper, and another including one Havriliak-Negami and one Cole-Cole function was utilized to a combination of past and present literature data in a wider frequency range from 100 kHz to 26.5 GHz. The adoption of previously published data at the frequencies below 45 MHz increases the valid frequency range of the model.

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