Abstracts

A Frequency-Dependent FDTD Method for Biological Applications

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A frequency-dependent finite difference time domain $(FD)^2$ TD method to calculate the response of pulse in plasma or water has recently been described. This method is an advance over the traditional finite-difference time-domain (FDTD) method in that it allows for the frequency dependence of these two media. In this paper, the $(FD)^2$ TD method has been modified to obtain broad band frequency information in 3-D biological applications. The implementation of this method is described and its accuracy is verified by comparison with analytic solutions using the Bessel function expansion. The use of this method is illustrated by an example of the 3-D simulation of a hyperthermia treatment using two-applicators over a frequency range of 40 to 200 MHz.

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