Abstracts

A Simple Convolution Procedure for Calculating Currents Induced in the Human Body for Exposure to Electromagnetic Pulses

J.-Y. Chen, C.M. Furse and O.P. Gandhi. "A Simple Convolution Procedure for Calculating Currents Induced in the Human Body for Exposure to Electromagnetic Pulses." 1994 Transactions on Microwave Theory and Techniques 42.7 (Jul. 1994, Part I [T-MTT]): 1172-1175.

The finite-difference time-domain (FDTD) and frequency dependent finite difference time-domain (FD)²TD methods have been previously used to calculate internal electric (E) fields and induced currents for exposure of the anatomically based model of the human body to electromagnetic pulses (EMPs) and contiguous wave (CW) sinusoids. The limitation of these methods is that a complete, computer resource intensive, simulation must be done for each different waveform of interest. This paper describes a simple and efficient technique based on convolution theory which provides the response of the body to any incident waveform (EMP or CW) from a single simulation with an incident impulse waveform. This allows the impulse response to be stored, and the response of the body to any desired waveform to be efficiently computed on a small computer or PC.

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