Abstracts

Limitations of the Cubical Block Model of Man in Calculating SAR Distributions

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Block models of man which consist of a limited number of cubical cells are commonly used to predict the internal electromagnetic (EM) fields and specific absorption rate (SAR) distributions inside the human body. Numerical results, for these models, are obtained based on moment-method solutions of the electric-field integral equation (EFIE) with a pulse function being used as the basis for expanding the unknown internal field. In this paper, we first examine the adequacy of the moment-method procedure, with pulse basis functions, to determine SAR distributions in homogeneous models. Calculated results for the SAR distributions in some block models are presented, and the stability of the solutions is discussed. It is shown that, while the moment-method, using pulse basis functions, gives good values for whole-body average SAR, the convergence of the solutions for SAR distributions is questionable. A new technique for improving the spatial resolution of SAR distribution calculations using a different EFIE and Galerkin's method with linear basis functions and polyhedral mathematical cells is also described.

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