Abstracts

Use of the Field-Iteration Method in Studying the Three-Dimensional Phased Array for Electromagnetic Hyperthermia

T. Deng. "Use of the Field-Iteration Method in Studying the Three-Dimensional Phased Array for Electromagnetic Hyperthermia." 1996 Transactions on Microwave Theory and Techniques 44.10 (Oct. 1996, Part II [T-MTT] (Special Issue on Medical Application and Biological Effects of RF/Microwaves)): 1778-1787.

The field-iteration method (FIM) is used for simulation of the three-dimensional (3-D) phased array for deep regional hyperthermia at a frequency of 200 MHz. The iterative equation involving the electric field integral equation is derived using the dyadic Green's function with singularities at source points. The electric field and specific absorption rate distributions in a circular cylindrical model of muscle-like medium and in a model of computerized tomography scans of a liver cancer patient are calculated, respectively, using different amplitudes and/or phases and/or positions of individual applicators of the H-horn phased array. The obtained numerical results compared with the moment method results are analyzed to assess the accuracy of the field-iteration method and also to predict the advantages of the 3-D phased array hyperthermia system.

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