Abstracts

Accuracy of Block Models for Evaluation of the Deposition of Energy by Electromagnetic Fields

M.J. Hagmann and R.L. Levin. "Accuracy of Block Models for Evaluation of the Deposition of Energy by Electromagnetic Fields." 1986 Transactions on Microwave Theory and Techniques 34.6 (Jun. 1986 [T-MTT]): 653-659.

Numerical solutions were made for block models using as many as 3048 cubes to approximate a prolate spheroidal model of man at 100 and 225 MHz. A high-frequency modification of Hohmann's formulation (HFH) gave values of mean absorption within five to seven percent of those with the Iterative Extended Boundary Condition Method (IEBCM). Arrangement of the cells for a best-fit approximation of the spheroid is essential for such high accuracy. Numerical quadratures using the cubical shape of the cells verified the high accuracy of the closed-form expressions used for HFH matrix elements. Quadrature over spheres having the same volume as the cells gave inaccurate values for the matrix elements. Values of average absorption calculated with 296, 560, 1376, and 1944 cell models of the prolate spheroidal model of man differed from each other by no more than 17 percent at frequencies of 10 to 400 MHz, and by 5.0 percent at the resonant frequency of 75 MHz.

❑ Return to main document.