Abstracts

Efficient Computation of SAR Distributions from Interstitial Microwave Antenna Arrays

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Electromagnetic and thermal modelling aids quantitative treatment by hyperthermia by enabling estimations of the temperature within a treatment volume to be given at locations other than those at which probes exist. The computation of SAR distributions within interstitial microwave dipole arrays is required both in the "far field" and "near field" regions of each dipole. Expressions for the approximate solution of the electric field distribution from an asymmetric imbedded dipole are derived and are shown to be accurate for the calculation of SAR distributions in the "far field." However, inaccuracies in the "near field" result in the need to evaluate an exact solution in this region, requiring a far more CPU intensive solution. To overcome this in the "near field" a "combination" solution has been derived from the approximate and exact solutions and shown to be in good agreement with the exact solution. The computation of the "combination" solution requires significantly (70-80%) less CPU time than the exact solution.

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