Abstracts

Mathematical Methods for Treatment Planning in Deep Regional Hyperthermia

D. Sullivan. "Mathematical Methods for Treatment Planning in Deep Regional Hyperthermia." 1991 Transactions on Microwave Theory and Techniques 39.5 (May 1991 [T-MTT] (Special Issue on Directions in Design and Applications of Microwave Systems)): 864-872.

Computer simulation for treatment planning in deep regional hyperthermia cancer therapy using the Sigma 60 applicator involves the optimization of several parameters. Because the programs to simulate such treatments are computationally intensive, it is impractical to rerun the programs for each new set of input parameters. Techniques are described which accelerate this process by separating the problem into responses by individual quadrants and by employing an impulse response to get multiple frequencies per run. The implementation of these techniques using the finite-difference time-domain (FDTD) method is described. The accuracy is tested against three-dimensional measurements made in a homogeneous phantom. The result is a method capable of planning an optimum treatment for deep regional hyperthermia.

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