Abstracts

Phased-Array Design Considerations for Deep Hyperthermia through Layered Tissue

P.A. Cudd, A.P. Anderson, M.S. Hawley and J. Conway. "Phased-Array Design Considerations for Deep Hyperthermia through Layered Tissue." 1986 Transactions on Microwave Theory and Techniques 34.5 (May 1986 [T-MTT] (Special Issue on Phased Arrays for Hyperthermia Treatment of Cancer)): 526-531.

Results are presented which demonstrate localized heating at depth, by a phased array in a homogeneous thorax phantom and the problems caused by a more realistic case of a layered tissue equivalent phantom. A phased array of contacting radiators is proposed for overcoming the difficulty of selective heating within the body cavity caused primarily by the muscle layer. The field from one aperture radiator in contact with layered tissue is predicted by a planar spectral diffraction algorithm incorporating transmission and reflection operations on the plane wave spectrum. This prediction process is validated by experimental results. The algorithm enables the prediction of a minimum number of phased contacting radiators required for selective heating within lung tissue through fat and muscle layers at 2.45 GHz, and provides a guide for the design requirements of a multiapplicator system.

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