

# Analysis and Optimization of Waveguide Multiapplicator Hyperthermia Systems

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**Abstract**— A method is proposed for determining the excitation coefficients of an antenna array operating in a large rectangular waveguide and used as a hyperthermia system. The excitation coefficients of the array elements are optimized for attaining an improved specific absorption rate (SAR) distribution around a deep-seated tumor. The method is applied to a two-dimensional problem of a piecewise homogeneous post in a waveguide representing a section of the human torso. The array is operating below the cutoff frequency of the dominant mode of the waveguide. Numerical simulations have been performed to check the effectiveness of this approach. The results show that by using the proposed optimization method, SAR distributions can be improved.

