Abstracts

A finite-element procedure based on a boundary-value approach for the evaluation of the electromagnetic exposure in biological phantoms

S. Caorsi, E. Bermani and A. Massa. "A finite-element procedure based on a boundary-value approach for the evaluation of the electromagnetic exposure in biological phantoms." 2002 Transactions on Microwave Theory and Techniques 50.10 (Oct. 2002 [T-MTT]): 2346-2352.

In this paper, a finite-element method, based on a boundary-value approach, for the evaluation of the electric-field distribution in exposed biological phantoms is presented. Starting from the measurement of the electric field around the phantom, the field prediction is obtained by solving a boundary-value problem. This allows to avoid the description of the electromagnetic source and to estimate of the electric-field distribution also when the illuminating source is unknown or when its numerical model is not available. In order to show the effectiveness of the proposed approach, some numerical results, concerning a two-dimensional geometry, are provided. Firstly, the accuracy and validity of the electromagnetic prediction are assessed by comparing numerical with reference solutions (analytically computed). In order to demonstrate the efficiency, robustness, and capability of this technique, different measurement strategies, noisy environments, and errors in the data acquisition are then taken into account.

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