Abstracts

Comparison of performances of electrical impedance tomography evaluated with 2-D and 3-D models

J. Chateaux and M. Nadi. "Comparison of performances of electrical impedance tomography evaluated with 2-D and 3-D models." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part I [T-MTT] (Mini-Special Issue on RF/Microwave Applications in Medicine)): 1874-1878.

This paper describes electrical impedance tomography (EIT) sensitivity evaluation using two models. The first is the classical circular two-dimensional (2-D) model used by past authors. The second is a three-dimensional (3-D) cylindrical model, which takes into account the height of the object under study. Having reported the analytical expression of the potential field of the 2-D model, the authors derive an equivalent solution for the 3-D case. Having analyzed the convergence of the solutions, they compute for different conductivity perturbations the ratio of the sensitivities obtained with the two models. Results indicate that the 2-D model, as compared with the 3-D model, generally overestimates sensitivity by a factor of two unless the conductivity perturbation is extensive and more conductive than the principal medium. In such a case, the 2-D model tends to underestimate EIT sensitivity.

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