Abstracts

Microwave tomography: theoretical and experimental investigation of the iteration reconstruction algorithm

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Results of experiments on the two-dimensional (2-D) quasi real-time microwave tomographic system have been reported. Various reconstruction possibilities of this system have been demonstrated on phantoms and canine hearts. The early utilized Rytov approximation is appropriate for low-contrast inverse problems. A new iterative reconstruction algorithm is proposed in this paper. The iterations converge to an accurate solution of the scalar Helmholtz-equation inverse problem in the case of higher contrasts. The goal of the reported study is an experimental and theoretical investigation of the proposed iteration algorithm. The influence on the quality of the reconstructed images and on the spatial resolution of such factors as the number of receivers, the accuracy of the scattered field measurements, and the dielectric contrast have been investigated.

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