Abstracts

A Model-Driven Approach to Microwave Diagnostics in Biomedical Applications

In this paper, a model-driven approach to microwave diagnostics for biological bodies is presented. The approach is developed in the space domain and is based on a numerical solution of the equation for the scalar two-dimensional (2-D) inverse-scattering problem. The aim is to use "a prior" information on the biological body under test (homogeneous along the transverse axis) in order to focus the investigation process on only one subdomain of the body, with a considerable computational saving. The method requires the numerical computation of the Green's function for an unperturbed model of the body in order to apply reconstruction techniques to a reduced investigation domain, which can be changed inside the body, with a reduction in on-line computation. The paper defines the mathematical formulation for a 2-D TM and presents the reconstructions of some schematized scatterers corresponding to living tissues.

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