Abstracts

Numerical assessment concerning a focused microwave diagnostic method for medical applications

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The possibility of focused microwave imaging in medical applications is investigated in this paper by means of a numerical assessment based on the forward scattering solution. As a text case, a human abdomen is considered and different electromagnetic sources operating at the working frequencies f=433 MHz and f=2.45 GHz are used. Many numerical investigations are performed in order to define the optimal dimensions of the reduced investigation domain. To quantitatively evaluate the effects of the reduction of the original investigation domain on the inversion data, suitable relative errors are defined. Once the reduced domain is defined, preliminary reconstructions are performed, aiming to evaluate the imaging capabilities of a global optimization technique when a focused approach is used for tomographic applications. Finally, some considerations are drawn and future developments of the proposed technique are indicated.

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