Abstracts

A Multiview Microwave Imaging System for Two-Dimensional Penetrable Objects

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The microwave imaging system proposed in this paper is based on a multiview numerical solution to the integral equation of 2-D TM scattering. This solution is achieved by the moment method, and a pseudoinversion transformation is used to face ill-conditioning problems. An experimental setup is described that employs a scanning subsystem for measuring the values of the scattered electric field inside an observation domain located outside the investigation one (i.e., the area containing the cross sections of cylindrical dielectric scatters). Rotations of the investigation domain with respect to the scanning subsystem and the transmitting antenna allow a multiview imaging process. The proposed imaging system does not require plane-wave illumination and does not use any first-order approximations; hence it may be used even in the case of strong scatterers. In addition, the off-line and once-and-for-all computation of the pseudoinverse matrix allows an inexpensive reconstruction in terms of computer resources. Some tests of the system were carried out, and the results are reported.

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