Abstracts

Image Reconstruction of a Complex Cylinder Illuminated by TE Waves

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The electromagnetic inverse scattering of a complex cylinder illuminated by transverse electric (TE) waves is investigated. The complex cylinder is a conductor coated by dielectric materials. A group of various unrelated TE waves is incident upon the object and the scattered fields are measured outside. With prior knowledge of the conductor's shape, the complex permittivity distribution of the dielectric materials can be reconstructed. The algorithm is based on the moment method and the unrelated illumination method. Some numerical examples are given to demonstrate the capability of the algorithm. Numerical results show that the dielectric constant and the conductivity distribution of the materials can be reconstructed even when the scattered fields are contaminated by random Gaussian noise.

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