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Inverse problem for a stratified uniaxial bianisotropic medium

An inverse scattering problem for an inhomogeneous uniaxial bianisotropic medium is studied. The permittivity, permeability, and chirality parameter tensors are assumed to vary continuously in one direction. An analytical frequency–domain approach to the problem of reconstruction of the material parameters will be presented. Input data for the inverse problem are taken to be the scattering data under illumination by plane harmonic waves propagated along the direction of stratification. The approach is based on the reformulation of the scattering problem as a 4×4 matrix Riemann–Hilbert problem of a holomorphic factorization in the complex plane of a spectral parameter (frequency). Uniqueness theorems are proven and a reconstruction algorithm is given.