Abstracts

A Coordinate-Free Approach to Wave Reflection from a Uniaxially Anisotropic Medium

H.C. Chen. "A Coordinate-Free Approach to Wave Reflection from a Uniaxially Anisotropic Medium." 1983 Transactions on Microwave Theory and Techniques 31.4 (Apr. 1983 [T-MTT]): 331-336.

This paper presents a coordinate-free method of solving the problem of electromagnetic wave reflection from the surface of a uniaxially anisotropic medium. Based on the direct manipulation of vectors, dyadics, and their invariants, the method eliminates the use of coordinate systems. It facilitates solutions and provides results in a greater generality. The paper contains the following results in coordinate-free forms: a) the dispersion equations; b) me directions of field vectors; c) the Poynting vectors (ray vectors) and group velocities d) the' laws of reflection and refraction; and e) the transmition and reflection coefficients. The results are valid for the incident wave having any polarization, and the optic axis of the uniaxial medium being arbitrarily oriented with respect to the interface and the plane of incidence.

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