Abstracts

Network Representation and Transverse Resonance for Layered Anisotropic Dielectric Waveguides

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First, the matrix wave impedance in an unbounded uniaxial lossless dielectric material is determined. Next, the transformation properties of the input impedance of a terminated anisotropic layer are established. It is then demonstrated that the boundary conditions in an anisotropic dielectric slab waveguide lead to a generalized transverse resonance condition involving the previously obtained matrix input impedances. Network equivalent representations are given for waveguides fabricated with dielectrics in polar and longitudinal orientations. The results show that a circuit approach to the analysis and design of planar anisotropic dielectric waveguides is feasible and practicable.

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