Energy and Power Orthogonality in Isotropic, Discretely Inhomogeneous Waveguides

By analysis of the scalar potential forms of the fields, it is shown that energy orthogonality conditions for a discretely inhomogeneously-filled waveguide are actually a special case of the more general power orthogonality conditions when the fields are purely TE or TM. Power orthogonality expressions for hybrid modes may be expressed in a new form in terms of the TE and TM contributions of the H-field alone or the E-field alone. This form involves only a dot product, simplifying practical analysis when the fields are expressed in terms of TE and TM components, and clarifies the relationship between energy orthogonality and power orthogonality.

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