Abstracts

Effect of losses on the spectral transition of modal poles between the improper and the proper Riemann sheets

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A descriptive analysis of the spectral creation and transition of modal poles between the two Riemann surfaces of the /spl gamma/-plane (/spl gamma/ is the propagation constant) for both lossless and lossy cases is presented. Proper poles are shown to be the spectral continuation of improper ones as a result of crossing between the corresponding Riemann sheets. In contrast to the lossless case, in which the pole transition takes place through the branch points only, poles of the lossy case can cross the branch cuts everywhere. It is also shown that the spectral band width of forward-wave and backward-wave propagation is influenced by losses. Although the presented analysis deals with the simple dielectric slab guide, the obtained results can be (at least qualitatively) generalized to other open guided-wave and leaky-wave structures. Numerical results are presented for lossless, lightly lossy and heavily lossy cases.

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