

Finite element modeling of non-self-adjoint waveguide problems

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The translation symmetry along the propagation direction of the waveguide can be used to reduce the dimensionality in waveguide modeling problems. Such dimensional reduction significantly saves the computational cost and has been used extensively in waveguides modeling. In contrast, if the waveguides contain anisotropic media, the dimensional reduction technique may potentially render the waveguide problem as a non-self-adjoint problem. In this work, the speaker and his research group study the conceptual consequences of the material anisotropy in waveguides and possible solutions to general non-self-adjoint waveguide problems using finite element method.