



Woon Siong Gan

Gauge Invariance Approach to Acoustic Fields

- Covers both theory and experiments on wave propagation in metamaterials
- Describes new formulations of acoustic fields in materials
- Offers an essential reference guide for researchers and practitioners alike

This book highlights the symmetry properties of acoustic fields and describes the gauge invariance approach, which can be used to reveal those properties. Symmetry is the key theoretical framework of metamaterials, as has been demonstrated by the successful fabrication of acoustical metamaterials. The book first provides the necessary theoretical background, which includes the covariant derivative, the vector potential, and invariance in coordinate transformation. This is followed by descriptions of global gauge invariance (isotropy), and of local gauge invariance (anisotropy). Sections on time reversal symmetry, reflection invariance, and invariance of finite amplitude waves round out the coverage.

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