

A discrete model for a honeycomb gyrotropic waveguide array

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Abstract

The problem considered is that of a honeycomb array of ferrite rods within an external magnetic field. The response is a gyrotropic permeability tensor that breaks time-reversal symmetry. As a result, the system exhibits nontrivial Chern numbers and chiral edge states. A perturbed Wannier method for deriving tight-binding models is discussed. The resulting discrete system is the well-known Haldane model. Nonlinear effects are considered.