Topological waves in lattice models with a combination of sublattice symmetry and spatial symmetry

Antonin Coutant*[1]

[1]Institut de Mathématiques de Bourgogne – CNRS : UMR5584, Université de Bourgogne-Franche-Comté – France

Abstract

We discuss the exotic properties of lattice models when it has the sublattice symmetry, combined with other spatial symmetries. We will show that appropriate combinations of those can lead to surprising effects of insensitivity to disorder, such as pinned eigenfrequency or perfect transmission. This robustness finds their origin in topological properties despite the absence of spin or broken time-reversal invariance. This absences allows for a simple transposition of these effects in the realm of classical waves. We will explain how to obtain them using acoustic networks, which are a particular class of metamaterials consisting in discrete lattices of acoustic waveguides.

*Speaker