

Topologically protected modes in acoustic networks

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The hallmark of topological phases of matter is the existence of localized modes on the edges, in addition to bulk waves predicted by the Bloch-Floquet theory. I will discuss a two-dimensional extension of the well-known Su-Schrieffer-Heeger model. In its topological phase, this model displays edge modes as well as corner mode (higher order topological insulator). I will present their main properties. In particular, a key property of these topological modes is their robustness to the presence of disorder. We will show under what precise conditions their existence and energy level are maintained when introducing disorder. Interestingly, this model can be exactly realised in acoustics using networks of waveguides. This allows us to experimentally test the topological properties in a setting of high controllability.

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