

## Topological currents in the bulk

J.K. Pachos

*Theoretical Physics Group, School of Physics and Astronomy, University of Leeds, Leeds LS2 9JT, UK*

Topological insulators have symmetry protected edge states that support robust currents on physical edges of the system. We provide evidence that such topological phases also support bulk currents that are activated by local potential gradients even if they do not cause a phase transition. I will show the behaviour we find for both the edge and bulk currents by using the Haldane model as an example. We demonstrate that bulk currents are topologically protected, like edge currents, and are not disturbed by noise such as temperature or local disorder. The resilience and the tuning of bulk currents with local potentials makes them an appealing medium for technological applications.