

Jointly organized by the Department of Physics and HK Quantum Institute of Science & Technology

CTCP SEMINAR

Torsional Hall Viscosity of Massive Chern Insulators

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Wednesday, November 26, 2025, 4:00pm

Room 522, 5/F, Chong Yuet Ming Physics Building,

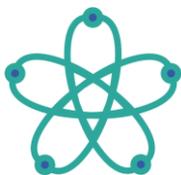
The University of Hong Kong

Abstract:

In this talk I will discuss a non-dissipative, parity-odd transport of (2+1)-dimensional relativistic fermions generated by torsion, namely the torsional Hall viscosity. After introducing the torsional Hall viscosity of massive Dirac fermions, I will discuss two experimentally relevant deformations of this phenomenon. Firstly, in the presence of a constant electromagnetic field, we find that the magnetic field induces a contribution to the torsional Hall viscosity that competes with the one originating from the Dirac mass. Then, we consider the band structure deformation quadratic in momentum terms that was proposed by Bernevig–Hughes–Zhang (BHZ). We find that the BHZ deformation enhances the torsional Hall viscosity in magnitude, but reverses its sign as compared to the standard massive Dirac fermion, indicating a Hall response in opposite direction to the typical Hall viscous force. Nevertheless, the torsional Hall viscosity still discriminates between topologically trivial and nontrivial regimes. These results pave the way for a deeper understanding of the topological response due to torsion and its possible verification in experiments.

ANYONE INTERESTED IS WELCOME TO ATTEND!

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