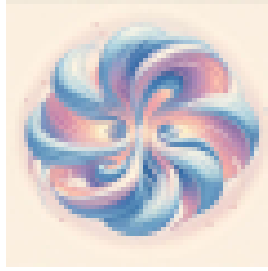


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Vortical waves in a fluid with massless fermions

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The anomalous axial symmetry of the Lagrangian for massless fermions is known to be ultimately responsible for a variety of macroscopic transport phenomena in rotating states, e.g. the chiral vortical effect (CVE) and chiral vortical separation effect (CVSE). Their coherent interplay gives rise to the chiral vortical wave. Traditionally, only the axial and vector degrees of freedom are included in the hydrodynamic analysis. In this talk, we generalise the previous approaches to include another conserved charge for massless free fermions, helicity, and obtain the spectrum of collective excitations. We explicitly introduce the dissipative effects and non-conservation of charges that arise due to interactions. Finally, we discuss the possible phenomenological impact for the quark-gluon plasma nucleated in heavy-ion collisions.

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