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Duality of gravity and hydrodynamics: quantum anomalies

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We show that there is a relationship between hydrodynamic effects in flat space and effects in a gravitational field. Moreover, this connection is valid at the quantum level in the case of quantum anomalies. In particular, we find in an accelerated and vortical medium a transport effect directly related to the gravitational chiral anomaly. The general theorem about this relationship is explicitly verified by comparing two independent calculations, quantum-field for the anomaly, and quantum-statistical for the transport coefficients, for the case of massless fields with spins $1/2$ and $3/2$.

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