

Kinematical vortical effect

Thursday, 2 March 2023 12:50 (20 minutes)

We consider a relativistic quantum fluid moving with vorticity and acceleration. It is shown that despite the space flatness, there is an effect directly related to gravity. Namely, an axial current arises, which depends on the acceleration and vorticity of the medium, and the conductivity in this current is determined by the gravitational quantum anomaly. This effect was called the Kinematic vortical effect and was derived by us in the general case. The general analysis has been then tested for quantum field theories with spins $1/2$ and $3/2$. In particular, using spin $3/2$ as an example, it is clearly shown that the cubic spin dependence of the gravitational chiral anomaly is reproduced in hydrodynamics.

Primary author: PROKHOROV, George (Dubna, BLTP)

Presenter: PROKHOROV, George (Dubna, BLTP)