

Chiral effects: new trends

Wednesday, 1 March 2023 12:00 (30 minutes)

Chiral effects were derived originally as a one-loop correction to vector and axial currents in media. Best known is the chiral magnetic effect which is a flow of electric current along an external magnetic field in chiral-imbalanced media. They reflect existence of the chiral gauge anomaly at short distances. Recently, interest has been shifted to the properties of infrared completions of the theory. The best candidate is a non-relativistic ideal fluid, with diffeomorphism as the intrinsic symmetry. There are specific dynamical features of the model such as the infrared copies of the anomalies, non-conservation (under certain conditions) of the electric current. The main emphasis is on generalizations to the case of chiral gravitational anomalies, elaborated in collaboration with G.Yu. Prokhorov and O.V. Teryaev. We concentrate on the interpretation of the so-called chiral kinematical effect and on generalizations of the equivalence principle to higher powers of gravitational acceleration.

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