

The search for magnetic-induced charged currents in Pb-Pb collisions with ALICE

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In non-central heavy-ion collisions unprecedented strong magnetic fields are expected to be produced (O 1018 Gauss), whose interplay with quantum anomalies of the Quark-Gluon Plasma (QGP) has been predicted to lead to a number of interesting phenomena, such as the Chiral Magnetic Effect (CME). While several experimental observations are partially consistent with predictions of a CME signal, it is often hard to distinguish them unambiguously from a combination of more mundane phenomena present in the anisotropic expansion of the QGP. This makes it imperative to establish that the early-time magnetic field has observable consequences on final-state charged particles and to calibrate its strength. We test a recent prediction of a pure electromagnetic effect which may arise in heavy-ion collisions. The varying magnetic field would induce a current within the QGP, which is expected to leave a very peculiar imprint on final-state particles: a contribution to directed flow which is asymmetric both in charge and pseudorapidity. We report the measurement of such an effect for unidentified charged particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV.

List of tracks

Chiral magnetic effect and wave, chiral vortical effect

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