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Search for the chiral magnetic effect at the LHC with the CMS experiment (Article) [\(Open Access\)](#)

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Abstract

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Searches for the chiral magnetic effect (CME) using charge-dependent azimuthal correlations with respect to event planes are presented in PbPb collisions at 5.02 TeV and pPb collisions at 5.02 and 8.16 TeV, with the CMS experiment at the LHC. The azimuthal correlations with respect to the second- and third-order event planes are explored as a function of pseudorapidity, transverse momentum, and event multiplicity, which provides new insights into the underlying background correlations. By employing an event-shape engineering technique, a linear dependence of charge-dependent correlations on the second-order anisotropy flow (v_2) is observed, and the upper limits on the v_2 -independent fraction, which is directly related to the CME signal, are obtained at 95% confidence level for both pPb and PbPb collisions. These results provide strong constraints on the search for the chiral magnetic effect at LHC energies, and establish new guidelines for searches in future experiments. © 2018

SciVal Topic Prominence

Topic: anomalies | hydrodynamics | axial charge

Prominence percentile: 96.443

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[CME](#) [Event Shape Engineering](#) [Particle Correlation](#) [Small Systems](#)

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