

# Hyperon local polarization in pPb collisions at CMS

The observation of hyperon polarization along beam direction ( $P_z$ ) in nucleus-nucleus collisions has opened a new way to study the complex vortical structures of the QGP. With the high-statistics data collected by the CMS experiment, we present the first  $P_z$  results for  $\Lambda$  and  $\bar{\Lambda}$  particles in pPb collision at  $\sqrt{s_{NN}} = 8.16$  TeV over a wide transverse momentum ( $p_T$ ) and charged particle multiplicity ( $N_{\text{trk}}^{\text{offline}}$ ) range. The  $P_z$  values decrease as a function of  $N_{\text{trk}}^{\text{offline}}$ , but increase with  $p_T$ . A hydrodynamic model that describes the observed  $P_z$  values in nucleus-nucleus collisions by introducing vorticity effects does not reproduce either the sign or the magnitude of the pPb results. These observations pose a challenge to the current theoretical implementation of spin polarization in heavy ion collisions and offer new insights into the origin of spin polarization in hadronic collisions at LHC energies.

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**Session Classification:** Parallel

**Track Classification:** Spin in heavy ion collisions