The 22nd International Conference on
Strangeness in Quark Matter
22-27 March, 2026, Los Angeles, CA

Contribution ID: **72** Type: **Oral Presentation**

Local Lambda polarization in light-ion with ALICE at LHC

Tuesday, 24 March 2026 09:45 (20 minutes)

Ultra-relativistic nuclear collisions create strongly interacting matter at extreme temperatures and energy densities, forming a quark–gluon plasma (QGP). Its space-time evolution is characterized by strong collective expansion, giving rise to anisotropic flow and demonstrating its nearly perfect fluid nature. This anisotropic motion generates local shear and vorticity along the beam direction, which induces a longitudinal component of hadron polarization via spin-orbit coupling. Measurements in heavy-ion collisions have revealed non-zero local Λ[uds] polarization, establishing it as a sensitive probe of the local vortical structure of the QGP. In contrast, light-ion collisions provide smaller, shorter-lived systems, where collectivity may be reduced or only emerging, offering a unique opportunity for testing the limits of hydrodynamics, the role of initial-state effects, and the mechanisms of angular-momentum transport at the smallest scales.
In this talk, we present new measurements of local Λ polarization in light-ion collisions with the ALICE detector at the LHC. By comparing these results with observations in Pb–Pb, theoretical predictions and the available measurements from the CMS collaboration in p-Pb collisions, we probe the onset of vortical phenomena in small systems and assess the minimal conditions required for the emergence of spin-vorticity coupling in QCD matter.

Author: ALICE COLLABORATION

Presenter: ALICE COLLABORATION

Session Classification: Parallel IV: Chirality, Vorticity and Polarization