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A study on transverse spherocity dependent initial and final state anisotropies in heavy-ion collisions at the LHC

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Transverse spherocity is an event shape observable which is capable of separating pQCD-dominated jetty events from soft QCD-dominated isotropic events. Recent studies show that transverse spherocity can be applied not only in pp collisions but in heavy-ion collisions, which are relatively dominated by soft-QCD processes. We take this scope of transverse spherocity to exploit its use to probe the correlation between the initial spatial anisotropy and final azimuthal anisotropic coefficients, namely, eccentricity, triangularity, elliptic flow and triangular flow in Pb-Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV using a multi-phase transport model (AMPT). We have found that both eccentricity and elliptic flow are anti-correlated with transverse spherocity, and triangular flow is positively correlated while triangularity has no dependence on transverse spherocity. This work also shows the nonlinear correlation between initial and final anisotropies for different transverse spherocity selections. Finally, we report a transverse momentum crossing point between the elliptic flow and triangular flow coefficients, which is found to vary with centrality and transverse spherocity selections.

Session

Heavy Ions and QCD

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