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Transverse Spherocity and Multiplicity Dependence of R_2 and P_2 Correlation Functions in pp Collisions at $\sqrt{s}$ = 7 TeV Using PYTHIA8

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Event shape observables such as transverse spherocity(S_0) have evolved as a powerful tool to separate soft and hard contributions in an event in small collision systems. To understand this phenomenon, we used two-particle differential-number correlation functions, R_2, and transverse momentum correlation functions, P_2, of charged particles produced in pp collisions at the LHC center-of-mass energy $\sqrt{s}$ = 7 TeV with the PYTHIA model. The $\Delta\varphi$-dependance of these correlation functions in different multiplicity and S_0 classes are discussed . We find that these correlation functions exhibit different shapes and sizes in both near-side(NS) and away-side(AS) with multiplicity and S_0 classes. We see a strong correlation in the NS and AS of these correlation functions for low-S_0(jetty-like), which become weaker for high-S_0(isotropic). In addition, mean-p_T of charged particles for low-S_0, high-S_0 and S_0-integrated are discussed. Finally, it was observed that S_0 should be a good observable as compared to multiplicity to disentangle jetty and isotropic events in a small collision system.

In-person participation

No

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