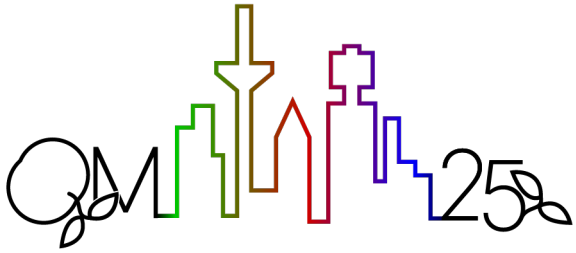

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Flattenicity as centrality estimator in p-Pb collisions simulated with PYTHIA/Angantyr

The centrality estimation in proton-nucleus collisions at the LHC is typically based on measuring charged-particle multiplicity or zero-degree energy. The former, however, induces a bias on the hardness of the proton-nucleon collisions, resulting in deviations from the binary nucleon-nucleon scaling of hard processes. In contrast, the energy deposited at zero degrees, i.e. at forward rapidities, by slow nucleons is shown to be insensitive to such a multiplicity bias.

In this contribution, an alternative centrality estimator based on a new event classifier, the charged-particle flattenicity, is proposed to study proton-lead collisions at a center of mass energy per nucleon-nucleon collision 5.02 TeV using PYTHIA 8 Angantyr. According to studies performed in pp collisions with PYTHIA 8, the flattenicity classifier shows sensitivity to multiparton interactions. It is less affected by selection biases towards larger transverse momenta than the multiplicity-based estimators. The results are compared with those obtained using other centrality estimators based on charged-particle multiplicity, at both mid and forward pseudorapidity. The identified particle production for the different estimators is also presented to explore the effects of multiparton interactions and colour reconnection.

Category

Experiment

Collaboration (if applicable)

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