

# 10th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



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## MPI dependence of the near- and away-side $p_T$ spectra for 5 TeV pp, p-Pb and Pb-Pb collisions with the ALICE detector at the LHC

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The similarities between pp, p-A and A-A collisions have not been fully understood. One issue when comparing e.g. transverse momentum ( $p_T$ ) distributions for different colliding systems at similar mid-rapidity multiplicity, is that selection biases and autocorrelations may play different roles. Recently, the use of the correlation between relatively high- $p_T$  tracks ( $p_T^{\text{leading}} > 5 \text{ GeV}/c$ ) and hadrons at lower momenta ( $0.5 < p_T^{\text{associated}} < 5 \text{ GeV}/c$ ) has been proposed in order to introduce a new multiplicity estimator. Based on distinct regions defined by  $\Delta\phi = \phi_{\text{leading}} - \phi_{\text{associated}}$ , the so-called transverse region,  $\pi/3 < |\Delta\phi| < 2\pi/3$ , can be used to build a multiplicity estimator ( $N_T$ ) which by definition does not contain the leading and sub-leading jet peaks. In pp collisions simulated with QCD-inspired event generators like PYTHIA,  $N_T$  is sensitive to Multiple Partonic Interactions (MPI).

This MPI-motivated analysis has been successfully applied to ALICE  $\sqrt{s} = 13 \text{ TeV}$  pp data; we now extend the study to bigger systems like p-Pb and Pb-Pb collisions. In this work, the  $p_T$  spectra in the near ( $|\Delta\phi| < \pi/3$ ), away ( $|\Delta\phi| > 2\pi/3$ ) and transverse regions will be presented a function of  $N_T$ . Results include measurements for pp, p-Pb and Pb-Pb collisions at  $\sqrt{s_{NN}} = 5.02 \text{ TeV}$ . Comparisons among the near and away side  $p_T$  spectra, at the same  $N_T$  and  $\sqrt{s_{NN}}$ , will be shown. The role of auto-correlations and potential effects of MPI in p-Pb and Pb-Pb collisions will be discussed. Comparisons with existing QCD-inspired event generators will be shown.

### Collaboration (if applicable)

ALICE

### Track

Jets and High Momentum Hadrons

### Contribution type

Contributed Talk

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