Contribution ID: **308** Type: **Poster Presentation**

Machine Learning Based Jet p_{T} Reconstruction with Full Jets in ALICE

Monday 4 November 2019 17:40 (20 minutes)

Reconstructing the jet transverse momentum is a challenging task, particularly in heavy-ion collisions due to the large fluctuating background from the underlying event. While the standard area-based method effectively corrects for the average background, it does not account for region-to-region fluctuations. These residual fluctuations are handled in an unfolding procedure following the background subtraction.

A novel method to correct the jet transverse momentum on a jet-by-jet basis to reduce these fluctuations by introducing a dependence on the jet fragmentation will be presented. We utilize machine learning techniques to reconstruct the full jet transverse momentum from jet parameters, including the constituents of the jet. The performance of this approach is evaluated using jets from PYTHIA simulations embedded into ALICE Pb–Pb data. In comparison to the standard area-based method, these machine learning based estimators show a significantly improved performance, which could allow for measurements of jets to lower transverse momenta and larger jet radii.

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Session Classification: Poster Session

Track Classification: Jet modifications and medium response