Motivation
- The inclusive production of charged particles in high-energy proton-proton collisions is a key observable to characterize the global properties of the collision.
- Particle production at LHC energies originates from the interplay of perturbative (hard) and non-perturbative (soft) QCD processes. These measurements provide constraints to phenomenological models as implemented in pQCD inspired generators such as PYTHIA.
- Data in pp collisions are reference for the study of nuclear effects in nucleus-nucleus and proton-nucleus collisions.

ALICE (A Large Ion Collider Experiment) is a general-purpose detector primarily designed for the study of the Quark Gluon Plasma in heavy-ion collisions. ALICE offers excellent particle identification (PID) and tracking capabilities.

For tracking of charged particles, the Inner Tracking System (ITS) and the Time Projection Chamber (TPC) are used.
- The ITS surrounds the interaction region as a six layer structure providing an accuracy of 50 μm for the reconstruction of secondary vertices.
- The TPC is the main Particle Identification (PID) and tracking detector of the central barrel.
- The V0 detector is mainly used as a trigger detector. It also provides information used for beam-gas event rejection as well as event multiplicity (p-Pb) and centrality (Pb-Pb) classification.

Event Selection
- About 1.5 million events pass the minimum-bias (MB) selection criteria.
- Events are required to have a valid reconstructed vertex within a range of |z| < 10 cm.
- The measurements reported have been obtained for events having at least one charged particle in the pseudorapidity interval |η| < 1 (INEL>0).

Track Selection
- Tracks are reconstructed using the combined information from the TPC and ITS detectors.
- A track is accepted if the number of crossed TPC pads is at least 120 (out of 159).
- High-purity selection of primary charged particles is achieved with a pT-dependent cut on the distance of closest approach in the transverse plane between the track and the primary vertex.

Results
The transverse-momentum distribution of charged particles is measured in the range 0.15 < p_T < 20 GeV/c and |η| < 0.8. The general features seen in the data are reproduced well by the models. Pythia8 (Monash-2013) predicts a harder spectrum than data. The spectrum is significantly harder at 13 TeV than at 7 TeV. Both Pythia8 (Monash-2013) and EPOS LHC reproduce the trend in the data but exhibit a more pronounced hardening with energy than data in the region of a few GeV/c.

The correlation of the spectrum with multiplicity is prominent for the whole p_T range and in particular it is stronger at high p_T. The general features seen in the data are reproduced by the models, but in detail there are visible disagreements.

Conclusions:
- Measurement of the transverse-momentum distribution of charged particles produced in proton-proton collisions at \( \sqrt{s} = 13 \) TeV.
- Spectrum is significantly harder than at \( \sqrt{s} = 7 \) TeV and shapes seem to depend strongly with charged-particle multiplicity as measured in the same kinematic region.
- The results are found to be in fair agreement with event generators commonly used at the LHC.

References

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