Charged-Particle Production as Function of Event Multiplicity in ALICE

Patrick Huhn¹ and Mario Krüger² for the ALICE Collaboration

Motivation

- ALICE experiment dedicated to study quark-gluon plasma in ultrarelativistic heavy-ion collisions
- Complementary reference measurements in proton-proton (pp) and proton-lead (p–Pb) collisions
- Medium effects can be examined by comparing production of charged particles
- Correlation between pₚ spectra and event multiplicity provides insight into particle production mechanisms

ALICE Experiment

Inner Tracking System (ITS)
- Primary vertex reconstruction
- Pile-up rejection

Time Projection Chamber (TPC)
- Main tracking detector
- Particle identification via dE/dx
- Multiplicity determination

VZERO system (V0)
- Triggering

Energy Dependence

System Size Dependence

Analysis Method

Energy Dependence

System Size Dependence

Analysis Method

Unfolding of pₚ Spectra
- Detector efficiency affects measured multiplicity and measured pₚ
- 2d-unfolding procedure [1]: $pₚ^{true}$ vs $N_{acc}$ vs $N_{ch}$

MC Closure Tests
- Unfolded $pₚ$ vs $N_{ch}$ compared to MC truth information
- Comparison to re-weighting method used in previous publications [2, 3]

References:

Patrick Huhn¹ and Mario Krüger² for the ALICE Collaboration

¹phuhn@ifk.uni-frankfurt.de, IKF, Goethe-Universität Frankfurt
²mkrueger@ifk.uni-frankfurt.de, IKF, Goethe-Universität Frankfurt

References:

Patrick Huhn¹ and Mario Krüger² for the ALICE Collaboration

¹phuhn@ifk.uni-frankfurt.de, IKF, Goethe-Universität Frankfurt
²mkrueger@ifk.uni-frankfurt.de, IKF, Goethe-Universität Frankfurt