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Meson as messengers for hot and dense QCD matter

Tuesday, 18 May 2021 14:15 (30 minutes)

We present results on the measurement of transverse momentum spectra, integrated yields, and angular distributions for light flavor hadrons with a focus on meson production in pp, p-Pb, Xe-Xe, and Pb-Pb collisions. Resonance particles with very short lifetimes probe the rescattering and regeneration processes in the hadronic phase of the system produced in high-energy collisions. The resonance yields and the transverse momentum spectra are analyzed as a function of the system size and collision energy and are compared with the model calculations with and without the hadronic cascades. Further, polarization measurements for vector mesons are crucial for the understanding of particle production mechanisms in high-energy collisions. In non-central heavy-ion collisions, the presence of the large initial angular momentum can polarize the vector mesons due to spin-orbital-angular-momentum interaction or due to hadronization from polarized quarks. We present recent measurements of spin alignment for $K^*(892)$ and $\phi(1020)$ mesons at midrapidity in pp and Pb-Pb collisions. Neutral meson invariant differential yields and nuclear modification factors provide important information on the modification of nucleon structure functions in nuclei and serve as a baseline for the observed strong suppression of hadron yields at high transverse momenta in heavy-ion collisions. The measurements for π^0 and η mesons are presented in pp and p-Pb collisions in a wide transverse momentum range up to tens of GeV/c and are compared to model calculations.

Collaboration

ALICE

Primary author: RIABOV, Viktor (Kurchatov Institute)

Presenter: RIABOV, Viktor (Kurchatov Institute)

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