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Particle-yield modification in jet-like azimuthal ϕ – hadron correlations in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with ALICE at the LHC

The measurement of azimuthal correlations between two particles is a powerful tool to investigate the properties of strongly-interacting nuclear matter created in ultra-relativistic heavy-ion collisions. In particular, studying the near-side and away-side hadron yields associated with trigger particles can provide important information to understand both the jet-medium interaction and hadron production mechanism. We study two-particle correlations with $V^0(K_s^0, \Lambda/\bar{\Lambda})$ and charge hadrons as trigger particles of transverse momentum $8 < p_{T, \text{trig}} < 16 \text{ GeV}/c$, and associated charged particles of $1 \text{ GeV}/c < p_{T, \text{assoc}} < p_{T, \text{trig}}$ at mid-rapidity in pp and Pb–Pb collisions at a center-of-mass energy of 5.02 TeV per nucleon pair. After subtracting the contributions of the flow background v_2 and v_3 , the per-trigger yields are extracted for two-particle azimuthal differences $|\Delta\varphi| < 0.9$ on the near-side and $|\Delta\varphi - \pi| < 1.2$ on the away-side. The ratio of the per-trigger yields in Pb–Pb collisions with respect to pp collisions, I_{AA} , is measured in the near-side and away-side in the most central 0–10% collisions. On the near-side, a significant enhancement of I_{AA} from 1.5 to 2 for different particle species is observed at the lowest $p_{T, \text{assoc}}$. On the away-side, suppression to the level of ($I_{AA} \approx 0.6$) for $p_{T, \text{assoc}} > 3 \text{ GeV}/c$ is observed as expected from strong in-medium energy loss while an enhancement reaching 1.4 at lowest $p_{T, \text{assoc}}$. The data are compared to AMPT, HIJING and EPOS models. Most calculations qualitatively describe the near-side and away-side yield modification at intermediate and high $p_{T, \text{assoc}}$.

Primary author: Mr ANAAM, Mustafa (PhD student)

Presenter: Mr ANAAM, Mustafa (PhD student)