

Charged particle production with respect to the Reaction Plane in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV

The centrality dependence of nuclear modification factor (R_{AA}) carries information about the path-length variation of partonic energy loss. However, the inclusive R_{AA} for a given centrality emerges by averaging over different path lengths as the overlap zone of two colliding nuclei has typically a nearly elliptical shape in the transverse plane. The partons traversing the medium in the in-plane direction are expected to lose less energy than out-of-plane, because they, on the average, have shorter path length inside the medium. In this sense, azimuthal dependence of R_{AA} w.r.t. reaction plane offers to get a tighter constraint on the actual path length traversed by the parton in medium.

Recently we published a paper on the charged particle R_{AA} [1], showing that the similar suppression as RHIC energy is observed, and moreover a rising trend for increasing p_T . Another interesting observation is the similarity of p_T -differential elliptic flow at low p_T between at RHIC and the LHC [2]. Since then, we have extended the p_T reach for R_{AA} with better precision and elliptic flow measurement up to 20 GeV/c with event plane, which allows us to study the path-length dependence of partonic energy loss with larger kinematic domain.

We present the latest ALICE results from Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV on charged particle yields with respect to reaction plane angle as a function of centrality and transverse momentum. These results allow for a detailed examination of the influence of geometry in the collision region and of the interplay between collective flow and jet-quenching effects.

[1] ALICE, K. Aamodt et al., Phys. Lett. B696, 30 (2011), 1012.1004.

[2] ALICE Collaboration, K. Aamodt et al., Phys. Rev. Lett. 105, 252301 (2010).

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Track Classification: Global and collective dynamics