New measurements of inclusive jet $R_{AA}$ with mixing technique and jet $v_2$ properties with ALICE

This talk presents new measurements of inclusive jet yield suppression and correlation with event-plane orientation to elucidate the kinematic and path-length dependence of jet energy loss due to quenching. We report measurements of the inclusive charged-particle jet yield in central Pb–Pb collisions, with the large uncorrelated background mitigated using a novel event mixing technique. This approach extends the jet $R_{AA}$ to lower jet $p_T$ than previously achievable, providing significant kinematic overlap with RHIC jet measurements. In addition to explorations of the low-$p_T$ frontier, we report the inclusive charged-particle jet $v_2$ in semi-central Pb–Pb collisions, thereby quantifying the yield dependence relative to the event-plane orientation and probing the pathlength dependence of jet energy loss. We also report more differential measurements of this azimuthal dependence by using event-shape engineering to select specific event topologies, and the jet substructure observable $R_g$ to select specific jet topologies. Such measurements improve our understanding of how jet suppression depends on both medium and jet properties. These results are compared to theoretical calculations, thus providing new insights into jet-quenching phenomenology and its underlying mechanisms.

Category

Experiment

Collaboration (if applicable)

ALICE

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