

Longitudinal momentum fraction of heavy flavor meson in jets in high-energy nuclear collisions

Tuesday 25 April 2023 17:20 (20 minutes)

Heavy flavor jets are powerful tools to gain insight into the in-medium partonic energy loss mechanisms and the transport properties of the quark-gluon plasma (QGP) in high-energy nuclear collisions. In this work, we present the first theoretical study of the longitudinal momentum fraction $z_{||}$ carried by D^0 meson in jets in Pb+Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The p+p baseline is provided by POWHEG+PYTHIA8 which matches the next-to-leading order hard processes with the parton shower. The in-medium evolution of heavy quark jets is employed by a Monte Carlo transport model which takes into account the collisional and radiative partonic energy loss in the expanding QGP. In A+A collisions, it is shown that the jet quenching effect would in general decrease the values of $z_{||}$. In addition, we predict visibly stronger nuclear modifications of B^0 -jet $z_{||}$ distributions compared to D^0 -jet within the same p_T windows.

Theory / experiment

Theory

Group or collaboration name

Primary authors: ZHANG, Ben-Wei (Central China Normal University); WANG, Sa (South China Normal University); LI, Yao

Presenter: LI, Yao

Session Classification: Poster Session

Track Classification: Heavy quarks and quarkonia