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Probing jet medium interactions via $Z(H)$ +jet momentum imbalances

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Different types of high energy hard probes are used to extract the jet transport properties of the Quark-Gluon Plasma created in heavy-ion collisions, of which the heavy boson tagged jets are undoubtedly the most sophisticated due to its clean decay signature and production mechanism. In this study, we used the resummation improved pQCD approach with high order correction in the hard factor to calculate the momentum ratio x_J distributions of Z and Higgs(H) tagged jets. We found that the formalism can provide a good description of the 5.02 TeV pp data. Using the BDMPS energy loss formalism, along with the OSU 2+1D hydro to simulate the effect of the medium, we extracted the value of the jet transport coefficient to be around $\hat{q}_0 = 4 \sim 8 \text{ GeV}^2/\text{fm}$ by comparing with the Z +jet $PbPb$ experimental data. The H +jet x_J distribution were calculated in a similar manner in contrast and found to have a stronger Sudakov effect as compared with the Z +jet distribution. This study uses a clean color-neutral boson as trigger to study the jet quenching effect and serves as a complimentary method in the extraction of the QGP's transport coefficient in high energy nuclear collisions.

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Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

Primary authors: Mr CHEN, Lin (Central China Normal University); Dr WEI, Shu-yi (CPHT, Ecole Polytechnique); ZHANG, Hanzhong (IOPP, CCNU)

Presenter: Mr CHEN, Lin (Central China Normal University)

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