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Medium response and jet shape modification in quark-gluon plasma

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In this talk, we present the MARTINI study of the modification of jet shapes in quark-gluon plasma. The focus of this study is the effect of medium response on the jet shape function in PbPb collisions at $\sqrt{s} = 2.76$ and 5.02TeV . As a jet parton propagates, the medium must respond to the energy and momentum deposited by the jet parton. The medium response thus re-distributes the lost energy around the jet axis, which manifests as the change in the jet-shape function.

To realize the effect of the medium back-reaction, we start with an IP-Glasma event with the corresponding map of binary collisions. The IP-Glasma event then initializes a 3+1D MUSIC hydro event while the map is used to initiate PYTHIA jets. After the initial hydro runs, we let jets propagate in the evolving medium and record the loss of the energy-momentum along the trajectories, keeping careful track of recoiling thermal partons as well as the jet parton shower. MUSIC is then re-run with the same initial condition but with the additional energy-momentum sources representing the lost energy-momentum of the hard partons, and this time we include the UrQMD afterburner. The hadronized hard partons are then combined with the soft hadrons for the reconstruction of jets. Using this realistic event-by-event simulation, we show that the presence of the medium back-reaction including the effect of recoiling thermal partons significantly influences the jet shape function.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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