Generalized angularities of heavy flavor and inclusive jets in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV at STAR

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Abstract

Jets originating from hard-scattered partons from the early stages of heavy-ion collisions travel through the Quark Gluon Plasma (QGP) and are modified or quenched relative to a p+p collision baseline. Moments of the jet's transverse momentum, p_{T}, profile in the $\eta - \varphi$ plane relative to the jet axis, called generalized jet angularities $\lambda_{\alpha}^{\kappa}$, are an important class of jet substructure observables to study in-medium modifications of the jet's radiation and fragmentation patterns. While previous measurements of these angularities were performed for inclusive jets in heavy-ion collisions at the LHC, similar measurements at RHIC will probe jet quenching in complementary regions of phase space, offering new insights. Performing these measurements for inclusive and D^0 meson-tagged jets in Au+Au collisions will provide new opportunities to investigate in-medium modifications of jet substructure and quark fragmentation for both light and heavy flavors.

In this contribution, we report on the first measurements of nuclear modification factor as a function of different generalized angularities for heavy flavor jets in heavy-ion collisions. The fully-corrected generalized jet angularities, such as Les Houches Angularity $\lambda_{0.5}^{1}$, girth λ_{1}^{1}, or thrust λ_{2}^{1} are measured for both inclusive and D^0 meson-tagged jets in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV, collected by the STAR experiment at RHIC. These results can provide insight into mass-dependent effects and will help distinguish between various models of jet quenching, and light and heavy flavor quark in-medium energy loss.