# Event-shape engineering of charged hadron spectra in heavy-ion collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV at STAR

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**Abstract**

Partonic scatterings with high momentum transfer occur before the formation of the quark-gluon plasma (QGP) in heavy-ion collisions and result in collimated collections of hadrons, called jets. The modification of the high-virtuality parton shower in the QGP compared to that in proton-proton collisions offers insight into the nature of the medium's interactions with colored probes. To study the path-length dependence of hard partons traveling through the QGP, we apply a technique known as event-shape engineering to data from heavy-ion collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV at STAR. Within a given eccentricity and centrality class, charged hadrons traveling in the event plane direction (having shorter path length) are compared to those traveling perpendicular to it (having longer path length). By fixing the centrality, we can control for the energy density. We then report a comparison of the ratios of in- and out-of-plane charged hadron spectra between two eccentricity classes, which accesses the dependence of energy loss on the collision geometry.