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Measurement of fully-reconstructed inclusive jet production in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 200 GeV by the STAR experiment

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The STAR Collaboration at RHIC reports the measurements of both charged and fully-reconstructed inclusive jet production in central (0-10\%) and peripheral (60-80\%) Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 200 GeV. The charged jet analysis utilizes a dataset corresponding to 70 μb^{-1} recorded in 2011, while the new fully-reconstructed jet analysis utilizes a dataset corresponding to 184 μb^{-1} recorded in 2014. Both datasets were recorded using a Minimum Bias trigger. Jets are reconstructed using charged-particle tracks in the Time Projection Chamber and neutral energy measured by the Barrel Electromagnetic Calorimeter with $p_{\rm T}(E_{\rm T}) > 0.2$ GeV/c (GeV). Jet reconstruction is carried out using the anti-$k_{\rm T}$ algorithm with resolution parameter R = 0.2, 0.3 and 0.4. The large background yield to the jet signal in heavy ion collisions is suppressed by requiring high-$p_{\rm T}$ leading charged or neutral radiation in accepted jet candidates. The bias imposed by this requirement is assessed, and the $p_{\rm T}$-region in which this bias is negligible is identified. Charged jet and fully-reconstructed jet inclusive distributions are reported in central and peripheral Au+Au collisions for $p_{\rm T}^{jet}$ >10 GeV/c. Yield suppression, corresponding to medium-induced parton energy loss, is observed for central Au+Au collisions relative to both peripheral Au+Au collisions and vacuum reference. Medium-induced jet broadening is measured using the R-dependence of yields. The results are compared to jet measurements at the LHC and theoretical calculations.

Collaboration (if applicable)

STAR

Track

Jets and High Momentum Hadrons

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