Measurement of fully-reconstructed inclusive jet production in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ 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 $\sqrt{s_{\mathrm{NN}}} = 200$ GeV. The charged jet analysis utilizes a dataset corresponding to 70 $\mu\mathrm{b}^{-1}$ recorded in 2011, while the new fully-reconstructed jet analysis utilizes a dataset corresponding to 184 $\mu\mathrm{b}^{-1}$ 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_{T} (E_{T}) > 0.2 GeV/c (GeV). Jet reconstruction is carried out using the anti-k_{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_{T} leading charged or neutral radiation in accepted jet candidates. The bias imposed by this requirement is assessed, and the p_{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 $p_{\mathrm{T}}^{jet} > 10$ 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.