

Elliptic flow measurements of light and heavy flavor hadrons, and J/ψ in Au+Au collisions at forward rapidity with PHENIX

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Measurements of elliptic flow (v_2) of light and heavy flavor particles can provide key insight into the transport properties and collective behavior of QGP. The PHENIX experiment has a unique forward rapidity coverage at RHIC ($1.2 \leq |\eta| \leq 2.2$), and large muon datasets collected in 2014 and 2016 with Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV, allowing for statistically significant heavy flavor v_2 measurements. Mid-rapidity data from RHIC indicate significant flow of open heavy flavor, while v_2 of J/ψ is consistent with zero within the large statistical uncertainty. At LHC energies, both open heavy flavor particles and J/ψ have non-zero v_2 measured in Pb+Pb and in p+Pb collisions. The influence of the initial and final state effects, charm thermalization and coalescence are under investigation both at RHIC and LHC. Most of the available RHIC measurements are at mid-rapidity. However, at forward rapidity the measurements sample different initial conditions, and the QGP has different temperature and pressure gradients, presenting an opportunity to disentangle competing effects. We present final results of v_2 of charged hadrons, muons from heavy flavor decays, and J/ψ , measured using the PHENIX muon arms from the combined high-statistics 2014 and 2016 Au+Au datasets. The results are compared to RHIC measurements at mid-rapidity and to measurements from LHC to provide a comprehensive picture of heavy flavor dynamics in QGP.

Category

Experiment

Collaboration

PHENIX

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