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Neutral pion and η meson production at midrapidity in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV

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Direct photons are useful probes to study the properties of QGP and the dynamic evolution of collision systems. Estimating and subtracting direct photons from hadron decays that contribute to the bulk of the measured photons is crucial and challenging. Although the most abundant source, $\pi^0 \rightarrow \gamma\gamma$ is well studied and constrained, $\eta \rightarrow \gamma\gamma$ is less constrained and the related study is scarce below $p_T < 2$ GeV/c. The ratio, η/π^0 exhibits universal behavior regardless of collision system, energy, and centrality in high p_T from the analysis of world data. However, associated measurements have been inconclusive in low p_T . Possible deviations from the universal behavior could be owing to the rapid radial hydrodynamic expansion of the $A + A$ collision system. PHENIX presents measurements of the centrality dependence of p_T spectra of π^0 and η and their ratio in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV with large statistics data taken in the year 2014. Thanks to the large Au+Au data sample taken at $\sqrt{s_{NN}} = 200$ GeV in the year 2014 and improved analysis methods, PHENIX is capable of studying the p_T spectra of π^0 and η down to 1 GeV/c and exploring the effect of radial flow on η/π^0 as a function of centrality.

Category

Experiment

Collaboration (if applicable)

PHENIX

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