

Measurement of $dE_T/d\eta$ in Au+Au collisions at 200 GeV with sPHENIX at RHIC

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The transverse energy in heavy ion collisions is one of the key observables characterizing global properties of the Quark-Gluon Plasma (QGP). The transverse energy per unit pseudorapidity ($dE_T/d\eta$) probes the energy carried by the medium along the longitudinal direction, providing essential information related to the initial geometry and subsequent hydrodynamic evolution of the QGP. Such studies are facilitated using recent data collected by the sPHENIX detector during the RHIC commissioning run in 2023 with Au+Au collisions at nucleon-nucleon center-of-mass energy of 200 GeV. The sPHENIX calorimeter system, comprising Electromagnetic and Hadronic Calorimeter detectors, covers a wide rapidity acceptance region as well as the full azimuthal phase space. This setup provides the capability for high-resolution measurements of photons, electrons, jets, and hadrons, and also allows particularly detailed $dE_T/d\eta$ measurements with high precision. This talk reports the first measurements of $dE_T/d\eta$ with the sPHENIX detector, which are also the first results for that observable at RHIC using a hadronic calorimeter. The results are presented in various centrality intervals and compared to the latest theoretical models, which will impose strong constraints on centrality-dependent particle production and initial conditions of the collisions at RHIC energies.

Category

Experiment

Collaboration

sPHENIX

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