

Detail study of the medium created in Au+Au collisions with high pT probes by the PHENIX experiment at RHIC

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PHENIX has been measuring high pT identified hadrons such as pi0 or eta since the beginning of the RHIC running. These measurements along with the baseline direct photon measurement led to the discovery of parton energy loss, a final state interaction with a medium, the quark-gluon plasma.

After accumulation of additional statistics in recent RHIC Au+Au runs, we were able to not only reduce uncertainties of golden channel measurements (e.g. pT spectra), but also extend the degree of freedom, such as the yield versus emission angle w.r.t event planes.

Detailed analysis of these measurements provided us deeper insight of the characteristics of the quark-gluon plasma. We have studied the average fractional energy loss (dE/E) of hadrons, as well as the path-length dependence of the energy loss. We have also measured higher order harmonic flows of high pT hadrons that would improve understanding of the medium from hydrodynamic point of view.

In this presentation, the recent high pT hadron results obtained by the PHENIX experiment will be shown, and the physics learned from the results will be discussed in detail.

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