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Measurement of Azimuthal Anisotropy with the New Reaction Plane Detector in the PHENIX experiment

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Azimuthal anisotropy of particle emission with respect to the reaction plane is one of the most important global observables in relativistic nucleus-nucleus collisions at RHIC.
The observation of a large anisotropy which follows specific scaling relations over a broad range of particle species is considered as evidence for the probable formation of a hot and dense partonic matter in Au+Au collisions at RHIC.
The accurate measurement of the reaction plane is a key factor in the study of azimuthal anisotropy.
In order to improve the resolution of such measurements in the PHENIX experiment at RHIC, we designed and fabricated a new Reaction Plane Detector (RxP).
RxP worked very well during the PHENIX Run7 period and demonstrated the design performance. As a result of the upgrade, the reaction plane resolution was improved by a factor of two.
This allows us to improve the precision of the measurements of azimuthal anisotropy for high-pT identified hadrons up to p_T of 6 GeV/c and v_4 up to p_T of 3 GeV/c and to perform a more detailed study of rare particles, such as Deuteron or Phi.

Primary author: IKEDA, Yoshimasa (University of Tsukuba, for the PHENIX collaboration)

Presenter: IKEDA, Yoshimasa (University of Tsukuba, for the PHENIX collaboration)

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