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The eta dependence of charged particle v_n measurements using the Silicon Vertex detector at RHIC-PHENIX

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In heavy-ion collisions, measurement of azimuthal anisotropy in emitted particle momentum distribution is a one of the important themes for the investigation of Quark Gluon Plasma (QGP). For this measurements, we need to be able to measure the reference reaction/event planes direction with good accuracy.

In 2011 the Silicon Vertex detector (VTX) was installed in the RHIC-PHENIX experiment. The VTX is composed of four layers, in which the inner two layers are built with pixel detectors and the outer two layers are built with strip detectors.

The VTX can reconstruct charged particle tracks and identify hadrons that include c/b-quark. The reaction plane reconstructed using the VTX is expected to have good resolution due to the wide eta acceptance of the detector, -1 to +1. One of the main purposes of VTX detector is to enable the measurement of the second and higher-order azimuthal anisotropy (v_2, v_3) of heavy quarks.

In this presentation, we will discuss the performance of the VTX detector in reaction plane resolution, as well as event plane correlations between different harmonic orders and between silicon and non-silicon detectors which have different eta acceptance. The eta dependence of higher order anisotropy will also be shown as part of a detailed investigation of non-flow effect as a function of eta-gap.

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