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Measurement of higher harmonic flow of ϕ meson in STAR at RHIC

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One of the main goal of the STAR experiment at Relativistic Heavy Ion Collider (RHIC) is to study the properties of hot and dense matter created in the collision of two heavy nuclei [1]. The higher harmonics of azimuthal anisotropy v_n of produced particles are believed to be a sensitive way to characterize the system created in the heavy-ion collision [2,3]. Moreover higher harmonics of ϕ meson will be the clean probe for the early dynamics since ϕ meson freeze-out early and it has small hadronic interaction cross section. The relation between various v_n is sensitive to thermalization and dissipation effects in heavy-ion collision [4].

In this presentation we will present the first measurements of ϕ-meson $v_3(p_T)$ and $v_4(p_T)$ at mid-rapidity in Au+Au collisions at $\sqrt{s_{NN}}$= 200 GeV. Centrality dependence of $v_3(p_T)$ and $v_4(p_T)$ will be shown and compared to corresponding v_2 values. Ratios between various harmonics will be presented and possible implication of those results will be discussed.

References

[1] J. Adams *etal.*(STAR Collaboration), Nucl. Phys. **A 757**, 102 (2005).

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[3] L. Adamczyk *etal.* (STAR Collaboration),Phys. Rev. **C 88**, 014904 (2013).

[4] C. Lang *etal.* arXiv:1312.7763 [nucl-th] (2013).

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