

1 **Anisotropic flow of ϕ mesons in Au+Au collisions at**
2 **$\sqrt{s_{\text{NN}}} = 14.6$ and 19.6 GeV in the second phase of**
3 **beam energy scan program**

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6 **Abstract**

7 The Relativistic Heavy-Ion Collider aims to study the deconfined state of quarks
8 and gluons known as Quark-Gluon Plasma and its transition from hadronic matter.
9 $\phi(s\bar{s})$ meson has a small hadronic cross-section implying lesser final state interac-
10 tions in the medium. Thus, the elliptic flow (v_2) of ϕ mesons is sensitive to the
11 properties of the medium in the initial stages of heavy-ion collisions. The v_2 of ϕ
12 mesons hints at being lower than that of the other hadrons and deviates drastically
13 from the number of constituent quark scaling below the center-of-mass energy of
14 19.6 GeV obtained in the first phase of Beam Energy Scan (BES-I) program indi-
15 cating a difference in dynamics of the medium. Triangular flow (v_3), originating
16 from initial geometry fluctuations, is suggested to be an even more sensitive probe
17 for the viscosity of the medium and initial density profile of the colliding nuclei.
18 Further, the ratios of higher-order flow harmonics are suggested to depend on the
19 transport properties of the medium.

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21 In this poster, we will present $v_2(p_T)$ and $v_3(p_T)$ of ϕ mesons and their ratio
22 in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 14.6$ and 19.6 GeV from the second phase of
23 Beam Energy Scan (BES-II) program. The centrality and energy dependence of
24 the observables will be presented. The new results shall also be compared with the
25 previous results from BES-I.