

1 Global spin alignment and elliptic flow of ϕ and K^{*0} vector
2 mesons in AuAu collisions in BES-II

3 Gavin Wilks, Xu Sun, Zhenyu Ye (for the STAR collaboration)

University of Illinois at Chicago, Chicago IL, USA

4 **Abstract**

5 Global spin alignment in heavy-ion collisions is the result of particles' spin preferentially
6 aligning with the large orbital angular momentum generated at the center of these systems.
7 The global spin alignment of vector mesons ($J^P = 1^-$) ϕ and K^{*0} could be sensitive to
8 hadronization scenarios and vorticity of the colliding system. To measure this quantity
9 reliably, several corrections must be applied to remove unwanted detector and event plane
10 effects. These effects include inefficiency due to limited detector acceptance and efficiency,
11 and finite event plane resolution from the use of different order of event plane (1st and 2nd)
12 in calculation. Finite elliptic flow (v_2) might affect global spin alignment by pushing more
13 particles toward the in-plane direction; therefore, a precise measurement on centrality
14 and transverse momentum (p_T) dependent v_2 will help to remove any potential bias in
15 the measurements. The Beam Energy Scan II (BES-II) at RHIC provides much greater
16 statistics and new data sets for AuAu collisions at low $\sqrt{s_{NN}}$ (7.7, 9.1, 11.5, 14.6, and 19.6
17 GeV), which will allow us to measure the global spin alignment and v_2 of ϕ and K^{*0} with
18 high precision. In this poster, we will discuss ϕ and K^{*0} reconstruction, signal extraction,
19 and correction procedures necessary to properly measure the global spin alignment of ϕ
20 and K^{*0} for BES-II data. Additionally, we report on the centrality and p_T dependence of
21 v_2 for ϕ and K^{*0} and discuss its effect on measuring global spin alignment.