

## Methods for extracting elliptic flow ( $v_2$ ) and cocktail fits of $\rho^0$ vector-meson in STAR at RHIC

In non-central nucleus-nucleus collisions, the azimuthal angle of the outgoing particles are correlated with the direction of the impact parameter and this phenomenon is known as anisotropic flow which is sensitive to the system properties evolved early in the collisions and hence provides evidence for the formation of a hot and dense medium created in such collisions. The measurement of elliptic flow ( $v_2$ ) of short-lived particles (for instance  $\rho^0$  mesons) at Relativistic Heavy Ion Collisions is studied through their decay products. The main focus in our study is the hadronic decay channel of  $\rho^0$  where  $\rho^0 \rightarrow \pi^+ + p t^-$ . The motivation of the  $\rho^0$   $v_2$  measurement is to test quark number scaling as predicted by coalescence models and to answer whether the  $\rho^0$  is directly produced or formed from pions in a hadronic phase. In this poster, we present the results of  $v_2$  for  $\rho^0$  vector mesons in  $Au + Au$  collisions at  $\sqrt{s_{NN}} = 200$  GeV from STAR. We discuss the extraction of the  $\rho^0$  yield with a hadronic cocktail fit after combinatorial background subtraction. We also discuss the invariant mass fit method used to measure the  $v_2$  for the  $\rho^0$  mesons in the presence of large background.

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