Measurements of ϕ production in Au+Au collisions at $\sqrt{s_{NN}}$ = 27 , 19.6 , 14.6 and 7.7 GeV with STAR

Weiguang Yuan[1], Yan Huang[1]
[1] Tsinghua University

The ϕ vector meson is the lightest bound state of hidden strangeness, consisting of a ($s\bar{s}$) quark-antiquark pair. It has a long lifetime (46 fm/c) and relatively small hadronic interaction cross section. Therefore, it is less susceptible to final-state effects and can be used to study the early evolution of the system. In addition, coalescence model calculations indicate that the Ω/ϕ yield ratio is sensitive to strange quark thermodynamic properties, and its dependence on collision energy can potentially be used to probe the onset of deconfinement.

In this poster, we will present new measurements on transverse momentum (p_T), rapidity (y), and centrality dependence of ϕ meson yields in Au+Au collisions at $\sqrt{s_{NN}}$ = 27, 19.6, 14.6 and 7.7 GeV using data taken during Beam Energy Scan (BES) II by the STAR experiment. Resonance to non-resonance yield ratios (ϕ/K) will be shown as a function of centrality for various collision energies. The nuclear modification factor using the peripheral Au+Au collision as a reference for ϕ at $\sqrt{s_{NN}}$ = 7.7-27 GeV will also be presented and the physics implications will be discussed.