

Energy and System Size Dependence of ϕ -meson Production in STAR

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We present the beam energy and system size dependence of ϕ ($s\bar{s}$) meson production in Cu+Cu and Au+Au collisions at $\sqrt{s_{NN}} = 62.4$ and 200 GeV measured in the STAR experiment at RHIC. The new data from Cu+Cu collisions and recently published data from Au+Au collisions [1] are presented for measurements made at mid-rapidity ($|y| < 0.5$) for $0.4 < p_T < 5$ GeV/c. At a given beam energy, the transverse momentum distributions for ϕ mesons are observed to be similar in yield and shape for Cu+Cu and Au+Au colliding systems at similar numbers of participating nucleons (N_{part}). A result different from observations on colliding ion size dependence of strange hadron production at AGS and SPS energies. The N_{part} normalized ϕ meson yields in nucleus-nucleus collisions are found to be enhanced relative to those from p+p collisions with a different trend compared to strange baryons. The enhancement for ϕ mesons are observed to be higher at 200 GeV compared to 62.4 GeV. These observations for the produced ϕ ($s\bar{s}$) mesons suggest that the source of enhancement of strange hadrons is related to the formation of a dense medium in high energy nucleus-nucleus collisions and cannot be solely due to canonical suppression of their production in smaller systems.

References

- [1] STAR Collaboration, B. Abelev et al., *Phys. Rev. Lett.* **99** (2007) 112301.