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Strange Hadron Production at High Baryon Density

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Strange hadrons have been suggested as sensitive probes for the medium properties of the nuclear matter created in heavy-ion collisions. At few-GeV collision energies, the formed medium is dense and baryon-rich due to the baryon stopping. Since strange hadrons are produced near or below the threshold, their yields, especially the excitation function of multi-strange (anti-)hyperons, may provide strong constraints on the equation-of-state (EoS) of high baryon density matter.

In this presentation, recent results on strange hadron production in Au + Au collisions at $\sqrt{s_{\rm NN}}$ = 3.0, 3.2, 3.5, 3.9 and 4.5 GeV with the fixed-target mode from the STAR experiment will be presented. These results include the transverse mass spectra, rapidity density distributions, particle ratios, and their centrality dependence of strange hadrons ($K^{\pm}$, K^{0}_{S}, ϕ, Λ, Ξ^{-}). These results will be compared with those from higher collision energies and physics implication will be discussed by comparing to the thermal and transport model calculations.

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