

Strange Hadron Production at High Baryon Density

Wenyun Bo¹, Hongcan Li¹, Li'Ang Zhang¹, Yingjie Zhou², Yue Hang Leung³,
Guannan Xie⁴, and Yaping Wang¹

¹Central China Normal University

²GSI Helmholtzzentrum für Schwerionenforschung

³University of Heidelberg

⁴University of Chinese Academy of Sciences

February 16, 2024

Abstract

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

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