

Strange Hadron Production at High Baryon Density

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Abstract

1 Strange hadrons have been proposed as sensitive probes for the properties of the hot
2 medium created in heavy-ion collisions, particularly at low collision energies where the
3 resulting medium is dense and baryon-rich due to baryon stopping. Additionally, at low
4 energy collisions, the strange hadrons can be produced near or below the nucleon-nucleon
5 threshold, thus, the energy and centrality dependence of the yields of strange hadrons,
6 especially those of multi-strange (anti-)hyperons, may provide strong constraints on the
7 equation-of-state (EoS) of high baryon density matter.

8 In this presentation, recent results on strange hadron production in Au + Au col-
9 lisions at $\sqrt{s_{NN}} = 3.0, 3.2, 3.5, 3.9,$ and 4.5 GeV with the fixed-target mode from
10 STAR will be discussed. These results include the collision centrality dependence of the
11 transverse mass spectra, rapidity density distributions, particle ratios of strange hadrons
12 ($K^\pm, K_S^0, \phi, \Lambda, \Xi^-$). These results will be compared with those from higher collision
13 energies, and compared to the thermal model and transport model predictions. Fi-
14 nally, we will also discuss future opportunities for the measurements of strange hadron
15 production in dense baryonic matter, including the CBM experiment at FAIR.