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Lambda-Lambda correlation in high-energy heavy-ion collisions

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We study Lambda-Lambda correlation in high-energy heavy-ion collisions based on the Lambda-Lambda interactions proposed so far. Lambda-Lambda interaction and the existence of H-dibaryon are long-standing problems in hadron physics. Since high-energy heavy-ion collisions at RHIC and LHC can be utilized as the exotic hadron factories [1], they would also provide information on exotic interactions such as Lambda-Lambda, Lambda-Sigma, Lambda-Xi interactions, which are important to understand neutron star matter EOS. We have analyzed recent STAR data [2] and find that small negative scattering length ($1/a_0 < -1 \text{ fm}^{-1}$) and large effective range ($r_{\text{eff}} > 3 \text{ fm}$) are favored for Lambda-Lambda interaction [3]. This is consistent with quark model interaction (fss2), recent boson exchange potential (NSC97), and old boson exchange potentials (ND, NF) with large hard-core radius. In the presentation, we first discuss how precisely we can constrain Lambda-Lambda interaction from heavy-ion data. We also discuss the effects of feed from heavier hyperons and coupling effects with Xi-N channel, and Lambda-Lambda correlation measured in (K-,K+) reactions [4].

[1] S. Cho et al.(ExHIC collab.), Phys.Rev.Lett.106, 212001 (2011).

[2] Neha Shar et al.(STAR collab.), Acta Phys. Pol. B Proc. Suppl. 5, 593 (2012) [arXiv:1112.0590].

[3] A. Ohnishi, T. Furumoto, in preparation.

[4] C.J.Yoon et al. (KEK-E522 collab.), Phys. Rev. C75, 022201 (2007); A. Ohnishi et al., Nucl. Phys. A670, 297c (2000).

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