Contribution ID: **179** Contribution code: **POS-LF-08** Type: **Poster**

Strangeness production from rare decays of heavy baryonic resonances and multi-particle interactions

Tuesday 14 June 2022 17:17 (1 minute)

Hadronic transport models are central approaches to study strangeness production from hadron interactions at low-beam energies.

At these energies, results from ArKCl and pNb collisions sparked interest in the last years, since much higher yields of double-strange hadrons were observed than theoretically expected. Therefore, in this work, a previously suggested mechanism to produce ϕ and Ξ hadrons via rare decays of high mass N^* resonances is explored with the transport approach SMASH[ˆ1]. This mechanism is able to reproduce the available experimental data for ϕ and Ξ with only one free parameter. Predictions for upcoming data for AgAg reactions at $E_{\mathrm{Kin}} = 1.58A$ GeV from HADES will allow to further constrain this approach. The predicted particle yields include complementary strangeness production of the more abundant K and $\Lambda + \Sigma^0$.

The high densities at these lower beam energies allow for multi-particle interaction as another class of reactions, also relevant for the production of (multi-)strange hadrons. Multi-particle reactions have been recently successfully introduced for the employed transport approach SMASH[ˆ2]. In this work, the relevance of different multi-particle reactions in nucleus-nucleus collisions is explored. They are found to significantly impact particle abundances. In particular, the relevance of $B\bar{B}$ regeneration reactions is a controversy discussed topic (”proton anomaly”). It is demonstrated that, when including the $5\pi \rightarrow p\bar{p}$ regeneration reaction in the transport calculation, half of the (anti-)proton yield that is lost due to annihilations is recovered at mid-rapidity[ˆ3]. By showing such sizable contributions, the findings motivate further exploration of multi-particle interaction in the strangeness sector.

[ˆ1]: JS, , N. Kübler & H. Elfner, Phys. Rev. C 103, 044904 (2021)

[ˆ2]: JS, D. Oliinychenko, J. M. Torres-Rincon & H. Elfner, Phys. Rev. C 104, 034908 (2021)

[ˆ3]: O. Garcia-Montero, JS, A. Schäfer, J. M. Torres-Rincon & H. Elfner, arXiv:2107.08812

Present via

Online

Author: STAUDENMAIER, Jan (Goethe University Frankfurt (FIAS))

Co-author: ELFNER, Hannah

Presenter: STAUDENMAIER, Jan (Goethe University Frankfurt (FIAS))

Session Classification: Poster

Track Classification: Light-flavor and Strangeness