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Nuclear Theory

Strangeness Production close to Threshold in Proton-Nucleus and Heavy-Ion Collisions

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We discuss strangeness production close to threshold in p+A and A+A collision. Comparing the body of available K+, K0, K-, and Lambda data with the IQMD transport code and for some key observables as well with the HSD transport code, we find good agreement for the large majority of the observables. The investigation of the reaction with help of these codes reveals the complicated interaction of the strange particles with hadronic matter which makes strangeness production in heavy-ion collisions very different from that in elementary interactions. We show how different strange particle observables can be used to study the different facets of this interaction (production, rescattering and potential interaction) which finally merge into a comprehensive understanding of these interactions. We identify those observables which allow for studying (almost) exclusively one of these processes to show how future high precision experiments can improve our quantitative understanding. Finally, we discuss how the K+ multiplicity can be used to study the hadronic equation of state.

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