



Contribution ID: 106

Type: **Contributed talk**

Open and hidden strangeness production in heavy-ion collisions

Monday, 8 July 2024 16:55 (20 minutes)

Strangeness production in heavy-ion collisions reveals the modification of the properties of strange hadrons in hot and dense nuclear matter. Adopting in-medium properties of antikaons ($\bar{K} = K^-, \bar{K}^0$) described by the self-consistent coupled channel unitarized scheme based on a SU(3) chiral effective Lagrangian (G-matrix), we study strangeness production in heavy-ion collisions within the off-shell Parton-Hadron-String Dynamics (PHSD) transport approach. The in-medium modification of kaons ($K = K^+, K^0$) are accounted via the kaon-nuclear potential, which is proportional to the local baryon density. Our results such as the rapidity distributions, pt-spectra, collective flows of (anti)kaon are found consistent with the experimental data on (anti)kaon production from the KaoS, FOPI and HADES Collaborations. Moreover, we demonstrate the sensitivity of kaon observables to the equation-of-state of nuclear matter.

We also study hidden strangeness production within in-medium effects realized by a width broadening which reflects the chiral symmetry partial restoration. Implementing novel meson-baryon and meson-hyperon production channels for ϕ mesons, calculated within a T-matrix coupled channel approach based on the extended SU(6) chiral effective Lagrangian model, along with the collisional broadening of the ϕ meson in-medium spectral function, we find a substantial enhancement of ϕ meson production in heavy-ion collisions, especially at sub- and near-thresholds, as shown in the experimental data at the HADES and STAR Collaborations. This allows to describe the experimentally observed strong enhancement of the ϕ/K^- ratio at low energies without including hypothetical decays of heavy baryonic resonances to ϕ as in alternative approaches. Our results support that the modifications of open and hidden strangeness hadrons in nuclear medium are necessary to understand various experimental data.

session

G. Heavy Ion Physics

Primary author: SONG, Taesoo (GSI)

Co-authors: BRATKOVSKAYA, Elena (GSI & Frankfurt Uni.); Prof. AICHELIN, Joerg (Subatech)

Presenter: SONG, Taesoo (GSI)

Session Classification: G. Heavy Ion Physics