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In-medium effects on hidden strangeness production in heavy-ion collisions

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We study the ϕ meson production in heavy-ion collisions from subthreshold energies of 1.23 A GeV up to RHIC energies within the microscopic Parton-Hadron-String Dynamics (PHSD) transport approach where the novel production channels of ϕ meson based on the coupled channel T-matrix approach are implemented along with the collisional broadening of ϕ -meson spectral width in medium. Since ϕ meson production is closely related to the production of kaon and antikaon, antikaon properties are described via the self-consistent coupled-channel unitarized scheme within a SU(3) chiral Lagrangian (G-matrix) which incorporates explicitly the s- and p- waves of the kaon-nucleon interaction, and the in-medium modification of kaons are accounted via the kaon-nuclear potential, which is assumed to be proportional to the local baryon density. The medium effects on the ϕ production is investigated by comparing with the experimental data from the FOPI, HADES and STAR Collaborations. The new production channels of ϕ meson as well as the broadening of the width in medium enhances the ϕ production near threshold energies and we find agreement with data without invoking unknown resonance decays, as done in alternative approaches.

Present via

Online

Primary authors: BRATKOVSKAYA, Elena (GSI, Darmstadt); SONG, Taesoo

Presenter: SONG, Taesoo

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