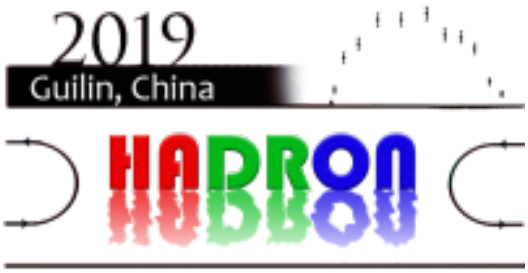

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Strong Absorption of Hadrons with Hidden and Open Strangeness probed with Pion-Nucleus Collisions at 1.7 GeV/c

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The modification of hadron properties in the strongly interacting environment resulting from heavy ion collisions (HIC) has been extensively studied for decades. However, in such highly dynamic processes it is difficult to address fundamental aspects. In fact, in-medium effects, which are expected to be present already at normal nuclear matter (ρ_0), can be studied in hadron-nucleus collisions in which the dynamics are less complex.

Pion-nucleus collisions are particularly well suited. Due to the large inelastic πN cross section, hadron production takes place in the vicinity of the nucleus surface, which on average leads to a longer path within nuclear matter of these produced hadrons. In total, 1.3×10^8 and 1.7×10^8 events have been collected with HADES in $\pi^- + C$ and $\pi^- + W$ at $p_{\pi^-} = 1.7$ GeV/c, respectively.

We present our results on the open and hidden strange meson ($K^{\pm}$ and ϕ) production in cold nuclear matter. Special emphasis will be put on the study of K^- absorption driven by strangeness exchange processes on one ($K^-N \rightarrow Y\pi$) or more nucleons ($K^-NN \rightarrow YN$). The data supports sizable K^- absorption in the heavier target (W) compared to lighter one (C). In addition, the ϕ absorption in the nuclear medium is studied by comparing the production in both nuclear environments. Our measurement provides for the first time evidence of a non-negligible absorption for both mesons, K^- and ϕ, in a model-dependent way. Comparisons to state-of-the-art transport model calculations will be presented as well. Besides, a comparative discussion of these results with respect to Au(1.23 GeV/u)+Au collisions measured with HADES will be shown.
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