

From photons to dikaon - Theoretical Insights into K^+K^- Production in Nuclear Collisions

Thursday 12 June 2025 17:00 (20 minutes)

Kaon pairs can be produced via photoproduction (γ -Pomeron) or photon-photon fusion ($\gamma\gamma$). A significant contribution to kaon pair production comes from the decay of scalar, tensor, and vector mesons. The study will provide a comprehensive description of dikaon production at both the elementary ($\gamma\gamma \rightarrow m \rightarrow K^+K^-$) and nuclear ($PbPb \rightarrow PbPbK^+K^-$) levels. The cross section for $\gamma\gamma$ fusion describes results from Belle, TPC/Two-Gamma and ARGUS experiments.

The latest ALICE data [1], which presents measurements of dikaon at midrapidity, unfortunately, does not provide experimental data for the dominant contribution, i.e. contribution from the decay of the $\phi(1020)$ meson. However, a Breit-Wigner distribution incorporating the decay of this resonance has been applied to describe the continuum component. This study aims to provide results across a broader range of kinematic variables and extend the analysis to additional decay channels.

The presentation will include a comparison of theoretical predictions with existing experimental data [1] (in midrapidity region), and provide predictions for the so-called forward range.

[1] ALICE Collaboration, S. Acharya et al., Phys.Rev.Lett. 132 (2024) 22, 222303

Author: KLUSEK-GAWENDA, Mariola (Institute of Nuclear Physics Polish Academy of Sciences)

Presenter: KLUSEK-GAWENDA, Mariola (Institute of Nuclear Physics Polish Academy of Sciences)

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