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Investigation of the strangeness production in the reaction $pp \to ppK^+K^-$ at HADES

Thursday, 25 June 2026 16:20 (20 minutes)

This talk presents the study of the strangeness production mechanisms in the reaction $pp \to ppK^+K^-$ reaction, analyzed using data collected with the HADES detector and a 4.5 GeV proton beam. The event selection is based on the particle identification, employing a domain-adversarial neural network, and a kinematic refit imposing four-momentum conservation. This results in the purity of the final sample reaching $S/B \approx 30$. Clear contributions from $\phi(1020) \to K^+K^-$ and $\Lambda(1520) \to pK^-$ are observed, with masses and widths consistent with the PDG data. The differential cross sections are obtained and used in the amplitude and angular analyzes, yielding a number of observables such as non-resonant enhancement in the effective pK^- and K^+K^- FSI scattering-length parameterization and vector meson $\phi(1020)$ spin density matrix elements. Additionally, strong meson-baryon coupling forming the $\Lambda(1405)$ is investigated in the K-matrix formalism with two channels pK^- and $\Sigma^0\pi^0$. This talk focuses on the interpretation of the recent results, comparing the production dynamics insights with the previous studies closer to the production threshold.

Collaboration

HADES

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