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Constraining coupled channels dynamics using femtoscopic correlations with ALICE at LHC

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Systems like $\overline{\mathrm{K}}\mathrm{N}$ and baryon–antibaryon ($\mathrm{B}\overline{\mathrm{B}}$) are both characterized by the presence of strong inelastic channels at the production threshold, which can affect the properties and the formation of bound states and resonances. The $\mathrm{K}^{-}\mathrm{p}$ interaction is characterized by the presence of several coupled channels, systems with a similar mass and the same quantum numbers as the $\mathrm{K}^{-}\mathrm{p}$ state, like $\overline{\mathrm{K}}^{0}\mathrm{n}$ and π . The strengths of these couplings to the $\mathrm{K}^{-}\mathrm{p}$ are crucial for the understanding of the nature of the $\Lambda(1405)$ and the attractive $\mathrm{K}^{-}\mathrm{p}$ strong interaction. Similarly, $\mathrm{B}\overline{\mathrm{B}}$ systems are characterized by the dominant contribution of several mesonic channels related to the presence of annihilation processes acting below 1~fm. The possible existence of $\mathrm{B}\overline{\mathrm{B}}$ bound states is still under debate because of the limited amount of data available for the p–p system, and either scarce or no experimental data is available for $\mathrm{B}\overline{\mathrm{B}}$ systems containing strangeness.

In this talk, femtoscopic correlations measured by ALICE in pp, p–Pb and Pb–Pb collisions are presented. In particular, results on the $\overline{\mathrm{K}}\mathrm{N}$ correlation function are shown, providing for the first time experimental constraints of $\overline{\mathrm{K}}^{0}\mathrm{n}$ and the $\pi\Sigma$ channels to the measured $\overline{\mathrm{K}}\mathrm{N}$ interaction. Finally, the results from $\mathrm{B}\overline{\mathrm{B}}$ pairs ($\mathrm{p}\overline{\mathrm{p}}$, $\mathrm{p}\overline{\Lambda}$ and $\Lambda\overline{\Lambda}$) are presented. The effect of annihilation channels on the correlation function and a quantitative determination of the inelastic contributions in the three different pairs are also discussed.

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Classifica Sessioni: Hypernuclei and kaonic atoms

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