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Dynamically generated resonances in the Lambda K- correlation function

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Traditionally, the study of strong interactions at the hadronic level has successfully relied on scattering experiments. Recently, however, new femtoscopic correlation measurements for hadronic pairs have provided further insights into the strong interaction between particles, especially at lower momenta. In this work, we use both types of datasets in parallel to perform theoretical simulations of the ΛK^- correlation function. We study the strangeness $S = -2$ sector within the framework of Unitarized Chiral Perturbation Theory, including not only the Weinberg-Tomozawa term but also the Born and Next-to-Leading Order (NLO) contributions in our interaction potential. Our model is fitted to the dataset of the nonleptonic $\Xi_c^+ \to \pi^+\pi^+\Xi^-$ weak decay from the Belle Collaboration, where the observation of $\Xi(1620)$ and $\Xi(1690)$ in their decay to $\pi^+\Xi^-$ was reported, and to the dataset of measurements of $\Lambda K^- \oplus \overline{\Lambda} K^+$ correlations obtained in pp collisions recorded by the ALICE Collaboration at the LHC. We aim to show that our model dynamically generates the $\Xi(1620)$ and $\Xi(1690)$ resonances and that, applying the femtoscopic technique, we are able to model a correlation function in fair agreement with the experiment, highlighting the importance of including the Born and NLO terms to obtain more precise results.

session

G. Heavy Ion Physics

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