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Study of the deuterons emission time in pp collisions at the LHC

The femtoscopy technique, applied to nucleus-nucleus collisions, is a powerful method for studying the properties of particle-emitting sources and providing precise insights into the final-state interactions of the produced hadrons. Through femtoscopy data analysis, key conclusions can be drawn about the existence of bound states, the nature of molecular states, and even the dynamics of three-body interactions by examining correlations involving deuteron-hadron pairs.

In this contribution, the mechanisms of light nuclei formation in high-energy collisions are addressed by comparing femtoscopy data from proton-proton (pp) collisions to a model for particle emission, CECA. By incorporating a time delay in the deuteron emission, a fit to the K^+d correlation function measured by the ALICE collaboration reveals a maximum value between 2 to 5 fm/c, indicating that deuterons in pp collisions at the LHC cannot form as compact, non-interacting objects.

[1] O. Vázquez Doce, D. Mihaylov, L. Fabbietti, arXiv:2412.04562 [nucl-ex]

Category

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