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A laboratory for QCD: how to employ LHC to study hadron-hadron interactions

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Improving the knowledge on how the strong interaction acts among hadrons is one of the frontiers in nuclear physics. A large amount of interactions among stable or unstable hadrons have not been measured yet and theoretical calculations with effective lagrangians and/or starting from first principles, with quarks and gluons as degrees of freedom, are still under development and in need of experimental data.
For nucleons, scattering experiments and measurements of nuclei binding energies have been successfully employed in the past to constrain two- and three-body interactions but when hadrons containing at least one strange or charm quark are involved, the experimental access becomes extremely challenging. The strong interaction involving strange and charm hadrons is relevant in many aspects such as the existence of exotic states and resonances whose nature is still not understood.
In this talk we show how we are able to constrain the hadronic interactions in the baryon and meson sector with strangeness and charm by means of correlations measured in different colliding systems at LHC. This experimental technique, known as femtoscopy, represents a perfect tool to access experimentally the strong interaction with an unprecedented precision in a large variety of hadronic systems.

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