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# Towards many body nuclear interaction studies at the LHC

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The residual strong interaction for two-body hadron systems has successfully been studied with an innovative technique at the LHC by the ALICE collaboration in recent years. Correlation in momentum space measured in pp and p-Pb collisions at the LHC energies for several hadron pairs involving strange hadrons have been employed to test the strong interaction with unprecedented precision. Lattice calculations could be tested and effective field theory results partially challenged. This kind of studies was possible even for hadron pairs containing charm quarks.

The new direction of such studies is now pointing to three-body systems, with the aim of providing an innovative tool to study the genuine three body interaction for several triplets. Such interactions are currently completely unconstrained if strange quarks are considered.

In this talk I will discuss the state of the art of such studies at the LHC, demonstrating that three baryon systems can be precisely measured at the LHC and that light nuclei can be exploited for such studies as well. I will show that an exciting new path is laid in front of us to investigate many body nuclear forces with innovative methods.

## Collaboration

ALICE

**Primary author:** FABBETTI, Laura (Technical University of Munich)**Presenter:** FABBETTI, Laura (Technical University of Munich)**Session Classification:** Plenary session