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Analysis techniques to study low-energy scattering with correlation techniques in small collision systems at LHC energies

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Femtoscopy is a powerful technique to relate correlations between particles with low relative momentum to the emission source and the final state interaction (FSI). Recent research by the ALICE collaboration has demonstrated the realization of a common baryon-baryon emission source in pp collisions, opening up new avenues for studying the properties of the FSI. The well-constrained source function allowed to test lattice calculations in the multi-strangeness sector by means of pΞ− and pΩ− correlations. Further, the pΛ system has been measured with unprecedented precision, and the ongoing Run 3 of the LHC will deliver a similar level of statistical significance in the entire strangeness sector, and possibly in some of the three-body systems, such as ppp and ppΛ. Systematic uncertainties will dominate the interpretation of these data unless the underlying processes are well described. The present contribution will discuss the main analysis techniques used in femtoscopy, the main sources of systematic uncertainties and the ongoing activities to reduce them. A particular focus will be set on the emission source function and a newly developed Monte-Carlo model (CECA), that can be used to study and constrain the properties of hadron emission. Further, the most effective ways of using femtoscopic data to constrain theoretical models will be
discussed.

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