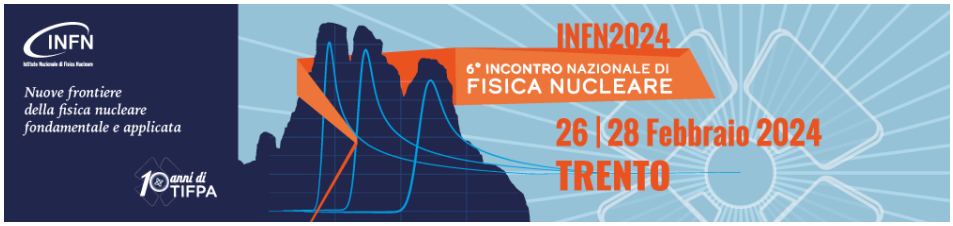

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The three-nucleon correlation function

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In the past few years the femtoscopy technique has been applied in high-energy pp and p−Pb collisions at the Large Hadron Collider (LHC) to study the residual strong interaction between hadrons. In such collisions, particles are produced and emitted at relative distances of the order of a femtometer, in the range of the nuclear force. The effect of the mutual interaction between hadrons is reflected as a correlation signal in the momentum distributions of the detected particles which can be studied using correlation functions. The latter incorporate information on the emission process as well as on the final state interaction of the emitted pairs at the femtoscopic scale. Therefore, by measuring correlated particle pairs at low relative energies and comparing the yields to theoretical predictions, it is possible to perform a new study of the hadron dynamics.

Recently, the ppp and pd correlation functions have been measured by the ALICE Collaboration. The interpretation of these measurements require a correct treatment of the three-nucleon scattering wave function which has to be used as input in the computation of the corresponding correlation functions. This observable reflects a complex structure when the three hadrons have low relative momenta mainly due to the contribution of the different partial waves. Traditional low-energy scattering experiments with three free hadrons in the ingoing channel are currently not yet available. Therefore, in the ppp case, the femtoscopic measurement gives a unique opportunity to study a $3 \rightarrow 3$ scattering process. In the pd case a very detailed discussion has been recently performed, showing that the description of the data is possible when a very sophisticated pd scattering wave function is used.

In the present contribution I will review the achievements in the description of the ppp and pd correlation functions and show preliminary results in the case of the $pp\Lambda$ correlation function.

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