

Nucleon-nucleon correlation functions from different interactions

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More and more data on correlation functions between hadrons as they can be measured in heavy-ion collisions using the femtoscopy technique [1,2] have recently become available. This applies not only to the nucleon-nucleon system but also to the hyperon-nucleon system. Thereby, they might help in the future to constrain hyperon-nucleon interactions.

As a first step in this direction, it is instructive to study the sensitivity of correlation functions on the interaction. I will present our results where we analyzed the sensitivity of the nucleon-nucleon correlation function on the nucleon-nucleon interaction [3]. Specifically, we calculated the correlation function based on the Argonne V18 interaction as well as based on different version of the Norfolk chiral EFT interactions [4] differing in regulation scale as well as in the fitting region of low-energy constants. In the momentum region between 0 and 500 MeV we found a sensitivity of almost 6 % for the nn system and up to 1.4 % for the pp system. Moreover, I will also present indications regarding the relation between the correlation function and phase shifts. Another focus of this work was the study of the convergence in the partial waves as well as the effect of coupling between channels.

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[4] Piarulli et al., Phys. Rev. C 94 (2016) 054007

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