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Femtoscopy using hyperon-nucleus correlation function

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Content

The two-particle momentum correlation function from high-energy nuclear collisions is beginning to be used to study hadron-hadron interaction. Because this observable is sensitive to the low-energy interaction, it is useful to study the nature of the near-threshold resonances and the underlying mechanism of the interaction. This new technique is leading to a better understanding of hyperon-nucleon interactions, which until now have been difficult to determine by scattering experiments.

In this talk, we focus on the correlation function using the 4He (alpha) particle. Because alpha is the composite particle whose central nuclear density reaches twice normal nuclear density, it is expected that the correlation function will exhibit behavior dependent on the internal structure of the potential. We show the results with the Lambda-alpha and Xi-alpha correlation obtained using effective models, and discuss how we can extract the information of the Lambda-N and the Xi-N interaction from the future experimental data [1,2].

Reference
[1] A. Jinno, Y. Kamiya, T. Hyodo, A. Ohnishi, PRC 110 (2024), 014001,
[2] Y. Kamiya, A. Jinno, T. Hyodo, A. Ohnishi, 2409.13207.

Field of Research: Interactions of mesons and baryons with strangeness
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