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Multiparticle femtoscopy with marginal distributions

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The usage of multiparticle correlation techniques for the study of genuine three-body and even higher-order interactions between hyperons and nucleons, which are relevant for instance for the description of equation of state of a neutron star, is plagued by difficulties in estimating consistently the background contribution to all terms (which are in general of different order) in the corresponding multiparticle cumulant expansion. In two-particle femtoscopy the background can be estimated with the mixed-event technique, but this approach appears to be impossible to reconcile with the standard cumulant formalism for the case of more than two particles.

We demonstrate how the mixed-event technique can be replaced with marginal distributions, which unifies multiparticle femtoscopy with the standard cumulant formalism. We discuss in detail whether the resulting new formalism satisfies the standard physical requirements (frame-independence, invariance to projection onto a single relative momentum variable, etc.).

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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