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Modelling the source for coalescence in small systems

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In accelerator experiments, the production of light (anti)nuclei such as (anti)deuterons and (anti)Helium can be studied in a wide range of collision systems from small (pp) to large (A–A) emission source sizes. However, the microscopic mechanism by which they are produced and how they survive such hot and turbulent conditions is still unknown. The most commonly used models to describe this process are the statistical hadronization model and the coalescence approach. In this talk, a state-of-the-art coalescence model based on the Wigner function formalism to describe (anti)nuclear production on an event-by-event basis is presented. Additionally, this model is parameter-free and tuned on experimental measurements of nucleon production spectra and of the emitting source size. Such a model would find application in astroparticle physics to predict (anti)nuclear fluxes in cosmic rays, which are a crucial ingredient for indirect Dark Matter searches.

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