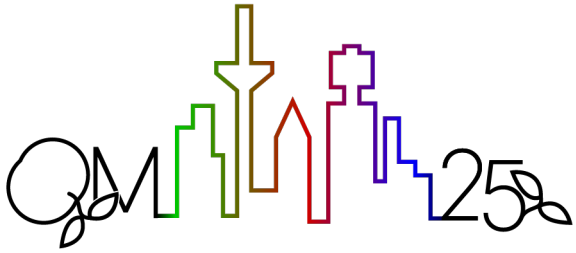

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Deuteron production in a combined thermal and coalescence framework for heavy-ion collisions in the few-GeV energy regime

A recently formulated thermal model for hadron production in heavy-ion collisions in the few-GeV energy regime is combined with the idea that some part of protons and neutrons present in the original thermal system forms deuterons via the coalescence mechanism. Using realistic parametrizations of the freeze-out conditions, which reproduce well the spectra of protons and pions, we make predictions for deuteron transverse-momentum and rapidity spectra. The best agreement with the experimentally known deuteron yield is obtained if the freeze-out temperature is relatively high and, accordingly, the system size at freeze-out is rather small. In addition, the standard Gaussian distribution of the relative distance between nucleons is replaced by the distribution resulting from their independent and approximately uniform production inside the initial thermal system.

Category

Theory

Collaboration (if applicable)

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