Contribution ID : **135** Type : **Oral talk**

Light-nuclei production in heavy-ion collisions at $\sqrt{s_{\rm NN}} = 6.4–19.6$ GeV in THESEUS generator based on 3-fluid dynamics

Friday, 2 December 2022 10:45 (15)

We present results of simulations of the light-nuclei production in relativistic heavy-ion collisions within the updated event generator based on the three-fluid dynamics (3FD), complemented by Ultra-relativistic Quantum Molecular Dynamics (UrQMD) for the late stage of the nuclear collision˜— the Three-fluid Hydrodynamics-based Event Simulator Extended by UrQMD final State interactions (THESEUS). The light-nuclei production is treated with the thermodynamical approach on the equal basis with hadrons. The simulations were performed for Pb+Pb and Au+Au collisions in the collision energy range of $\sqrt{s_{NN}} = 6.4–19.6$ GeV. Their results are compared with available data from the NA49 and STAR collaborations, rapidity distributions and transverse-momentum spectra. The updated generator revealed not perfect, but a reasonable reproduction of the data on the light nuclei, especially the functional dependence on the collision energy and light-nucleus mass. It is important that this reproduction is achieved without any extra parameters, while the coalescence approach in 3FD requires special tuning of the coalescence coefficients for each light nucleus separately. The collective flow, directed and elliptic ones, are also considered.

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Session Classification : Heavy Ion Physics

Track Classification : Heavy ion physics