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Investigation of sources affecting longitudinal particle production in heavy-ion collisions using spectators

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Understanding the sources controlling the longitudinal distribution of produced particles in relativistic heavy-ion collisions is crucial for characterizing the shape of the Quark-Gluon Plasma (QGP). Previous measurements on forward-backward multiplicity correlations, directed flow, and flow decorrelations have provided strong model-dependent constraints on emission profiles of initial state sources. Therefore, understanding the longitudinal evolution of particle production is essential for constraining various models of heavy-ion collisions.

In this talk, we will present correlation coefficient $\rho(nA_{sp}, nA_{ch,\eta})$, as a function of pseudorapidity (η), between the forward-backward asymmetry of initial-state spectators (A_{sp}) and final-state multiplicities ($A_{ch,\eta}$) in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV using a multi-phase transport model (AMPT) to quantify the contribution of preferential emission from initial state sources to the longitudinal distribution of produced particles. Additionally, the sensitivity of the correlator to spectator matter dynamics, such as fragmentation and evaporation, will be discussed. These findings motivate the experimental measurement of this correlator to constrain initial state sources that control the longitudinal particle production of the QGP matter.

Details

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Is the speaker for that presentation defined?

Yes

Name of experiment and experimental site

N/A

Is this an abstract from experimental collaboration?

No

Internet talk

Yes

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