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Collective flow analysis using bulk and strange hadrons produced in relativistic heavy-ion collisions

The investigation of the properties of nuclear matter under extreme conditions is one of the main goals of the relativistic heavy-ion collisions. The analysis of transverse momentum spectra of produced particles provide insights into the particle production mechanisms as well as the freeze-out conditions of the system created in these collisions. We present the study of the kinetic freeze-out properties of non-strange hadrons ($\pi^{\pm}$, p, $\overline{\mathrm{p}}$, d, $\overline{\mathrm{d}}$) along with strange hadrons ((K^0_S, , -, $^-$, -$^+$, ϕ, $^-$, and -$^+$) in relativistic heavy-ion collisions at RHIC-BES energies. The energy and centrality dependence of freeze-out parameters, i.e., kinetic freeze-out temperature and collective flow velocity, extracted using the Blast-Wave model, for non-strange and strange hadrons will be presented. The average transverse momentum $< p_T >$ of strange hadrons as a function of system centrality and reduced hadron mass, m/n_q, will be also presented. We observe in central Au-Au collisions that $< p_T >$ as a function of reduced mass is higher for baryons than that for mesons, although it increases linearly with m/n_q. However, for peripheral events, there is an approximate scaling of average p_T with the reduced hadron mass. These results will be compared with AMPT simulations, default and string-melting versions, in order to understand the importance of partonic degrees of freedom in collectivity observables.

Category

Experiment

Collaboration (if applicable)

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