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Study of strange particle pT spectra in heavy-ion collisions at relativistic energies

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The transverse momentum distributions of identified hadrons contain information about the collective expansion and the freeze-out properties of the nuclear matter created in high-energy heavy-ion collisions. Due to different hadronic interaction cross-sections, it is assumed that different particle species freeze-out from the fireball at different times when the system has different temperatures and collective flow velocities. Boltzmann-Gibbs blast-wave model was used to analyze the pT spectra of strange hadrons (K^0_S, , -, $^-$, -$^+$, ϕ, $^-$, and -$^+$) produced in Au+Au collisions at RHIC-BES energies. The kinetic freeze-out temperature, the transverse flow velocity and the flow profile exponent will be presented and discussed as a function of collision centrality and energy. The results indicate that the strange hadrons tend to decouple earlier from the system than the bulk hadrons (charged pions, kaons, protons and antiprotons), having a smaller average transverse flow velocity. The centrality and energy dependence of the average transverse momentum of strange particles will also be presented. For peripheral Au+Au collisions, the average pT is found to scale with the reduced hadron mass, i.e., mass divided by the number of quark constituents (m/nq). The scaling is broken in most central Au+Au collisions, where, the average pT is higher for baryons than that for mesons and increases linearly with m/nq. The results will be compared with previous results from SPS and RHIC experiments.

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