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Baryon spectra and antiparticle/particle ratios from the improved AMPT model

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The string melting version of a multi-phase transport model is often applied to high energy heavy ion collisions since the formed dense matter is expected to be in parton degrees of freedom. In this work we improve its quark coalescence component, which describes the hadronization of the partonic matter to a hadronic matter. We have removed the previous constraint that forced the numbers of mesons, baryons, and antibaryons in an event to be separately conserved through the quark coalescence process. A quark now could form either a meson or a baryon depending on the distance to its coalescence partner(s). We then compare results from the improved model with the experimental data on hadron dN/dy, p_T spectra, and v_2 in heavy ion collisions from $\sqrt{s_{NN}}$ = 62.4 GeV to 5.02 TeV. We show that, besides being able to describe these observables for low-p_T pions and kaons, the improved model also better describes the low-p_T baryon observables in general,especially the baryon p_T spectra and antibaryon-to-baryon ratios for multi-strange baryons.

List of tracks

Freeze-out, hadronisation and statistical models

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