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Hadron production within PHSD

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We study the production of (anti-) strange and multi-strange hadrons in heavy-ion collisions from FAIR/NICA to LHC energies within the Parton-Hadron-String Dynamics (PHSD) microscopic transport approach, which contains the partonic and hadronic dynamics. By showing the channel decomposition for the strangeness production we demonstrate how with increasing energy the production in the QGP dominates the hadronic production. We observed traces from the QGP by looking at a verity of ‘bulk’ observables like the excitation functions of particle yields, pt- and rapidity distributions, centrality dependencies of yields, etc. A striking disagreement between the PHSD results and the available data persists for bombarding energies below $\sqrt{s_{NN}} \approx 8$ GeV where the strangeness production is significantly underestimated as in earlier HSD studies. This finding implies that the strangeness enhancement seen experimentally at FAIR/NICA energies cannot be attributed to a deconfinement phase transition or crossover but probably involves the approximate restoration of chiral symmetry in the hadronic phase.

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