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Suppression of resonance production in high multiplicity pp events due to colour reconnection effects in PYTHIA8

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The measurement of short-lived hadronic resonances in high energy collisions has always been considered an important observable to investigate the properties of the systems created in such collisions. In particular, the observed suppression of the measured yields of resonance with respect to non-resonance particles towards central heavy-ion collisions has so far been interpreted as being due to re-scattering of decay daughters in a hadronic phase of the system evolution. However, hints of suppression in the measured resonance to non-resonance particle ratios have also been recently observed for high multiplicity events in collisions of small systems, such as pp and p-Pb. In this work, we explore the effects of colour reconnection (CR) mechanisms, such as the new more QCD based scheme and the rope hadronization approach, in hadronic resonance production in high multiplicity pp collisions using the PYTHIA8 event generator. Our studies have shown that the inclusion of CR leads to a suppression of hadronic resonance production with respect to non-resonance states, observed in the evolution of the ratios of K^*/K , ρ/π and η'/π as a function of the event activity. These results bring an alternative possible explanation for the phenomenon in small systems collisions. Finally, we discuss other heavy-ion observables that may also be affected by CR, such as those associated with collectivity.

Content type

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