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Modeling the influence of string collective phenomena on the long range rapidity correlations between the transverse momentum and the multiplicities

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The long-range rapidity correlations between the multiplicities (n - n) and the transverse momentum and the multiplicity (p_T - n) of charge particles are analyzed in the framework of the simple string inspired model with two types of sources. The sources of the first type correspond to the initial strings formed in a hadronic collision. The sources of the second type imitate the appearance of the emitters of a new kind resulting from interaction (fusion) of the initial strings. The model enabled to describe effectively the influence of the string fusion effects on the strength both the n - n and the p_T - n correlations.

It was found that in the region, where the process of string fusion comes into play, the calculation results predict the non-monotonic behavior of the n - n and p_T - n correlation coefficients with the growth of the mean number of initial strings, i.e. with the increase of the collision centrality. It was shown also that the increase of the event-by-event fluctuation in the number of primary strings leads to the change of the p_T - n correlation sign from negative to positive. One can try to search these signatures of string collective phenomena in interactions of various nuclei at different energies varying the class of collision centrality and its width.

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