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Combinants of multiplicity distribution in the Monte Carlo model with string fusion

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The properties of the multiplicity distribution of the charged particles, produced in pp collisions at high energy, can be studied using combinant analysis [1,2]. The modified combinants C_j show the interplay between the neighboring probabilities, and satisfy the following recurrence relation:

$$(N+1)P(N+1)=\sum_{j=0}^{N} C_j P(N-j)$$

The combinant analysis of the experimental data at LHC showed peculiar oscillatory behavior, that can not be to reproduce using standard distributions, usually applied to the N_{ch} distributions (like Poisson and NBD), and in models [3]. It was showed that in the multi-pomeron exchange model the oscillation is sensitive to the multiplicity distribution from one emitting source and to the very first points of the overall pp multiplicity distribution [4].

In this report the combinants of the multiplicity distribution are considered in a Monte Carlo model with string fusion [5,6]. The charged particles spectra and distributions are obtained in the picture of quark-gluon strings, with the inclusion of string interaction in transverse plane, carried out in the
framework of local string fusion model with the introduction of the lattice in the impact parameter plane and taking into account the finite rapidity length of strings. The parameters of the model were fixed with experimental data on inelastic cross section and charged multiplicity at high energy range.

We studied the multiplicity distributions and combinants of different particle species and the influence of the string fusion and contribution of the short strings, as well as resonance production, on the combinants.

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Primary author: KOVALENKO, Vladimir (Saint Petersburg State University)

Presenter: KOVALENKO, Vladimir (Saint Petersburg State University)