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Combinant analysis of multiplicity distributions in p+p interactions in multipomeron exchange model

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Studies of multiplicity fluctuations and the shape of multiplicity distributions (e.g. the KNO scaling) are among the basic components of relativistic nuclear physics. Combinants being the linear combinations of ratios of probabilities, as well as widely used cumulants, are quantities that characterize a distribution. Recently it was found that combinants obtained from multiplicity distributions in p+p interactions at LHC collision energies exhibit an oscillatory behavior that is not reproduced by the standard statistical distributions such as negative binomial.

Modified multipomeron exchange model [1-4] successfully reproduces the general features of p+p and p+\bar{p} collisions such as energy dependence of charged multiplicity (Nch), transverse momentum <pt> as well as the experimentally observed transition from negative to positive <pt> - Nch correlation. In this paper, we test whether the oscillating nature of combinants is present in the model, argue the importance of precise measurements of events with zero multiplicity, and introduce a modification to the combinants definition in order to deal with truncated distributions.

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