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The strongly intensive observable in pp collisions at LHC energies in the string fusion model

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The properties of the strongly intensive variable [1] characterizing correlations between the number of particles produced in two observation windows separated by a rapidity interval [2] in pp interactions at LHC energies are studied in the framework of the string fusion model [3]. The effects of the string fusion are taken into account by introducing a finite lattice (a grid) in the impact parameter plane [4]. The analytical calculations are supplemented by the MC simulations permitting to take into account the experimental conditions of pp collisions in ALICE at LHC.

As a result, the dependence of this variable both on the width of the observation windows and on the value of the gap between them was found for several initial energies. It is demonstrated that in pp collisions at LHC energies the string fusion effects have a significant impact on the behavior of this strongly intensive variable. At that the role of these effects is increasing with the initial energy and centrality of the collision.

We show that the comparison of our model results with the preliminary experimental values of the strongly intensive variable obtained by the analysis of the ALICE data on pp collisions at 0.9 and 7 TeV enables to extract information on the parameters characterizing clusters with different numbers of merged strings, in particular, to find their two-particle correlation functions and the average multiplicity of charged particles from cluster decays.

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