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## Monte-Carlo based investigation of long-range correlations and fluctuations at the Large Hadron Collider energies

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The correlation between particles produced at various pseudorapidity values is an important probe to disentangle the underlying dynamics of multi-particle production in high energy collisions. The long-range correlations are believed to be free from final-state effects. The correlation strength ( $b_{corr}$ ) has been studied for forward ( $N_F$ ) and backward ( $N_B$ ) charged particle multiplicities. The  $b_{corr}$  has been investigated as a function of gap between the forward and backward pseudorapidity windows as well as the width of these windows. These  $b_{corr}$  has also been studied for positively and negatively charged particle multiplicity in forward and backward intervals, respectively. The strongly intensive fluctuation measure ( $\Sigma$ ), which reduces to unity in absence of any inter-particle correlations, has also been investigated by employing the two extensive variables i.e.,  $N_F$  and  $N_B$ .

The effect of processes like multiparton interaction (MPI) and color reconnection (CR) is also taken into account. The events have been simulated for proton-proton and Pb-Pb collisions at the Large Hadron Collider energies using the Pythia8 event generator.

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