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Long range forward-backward multiplicity correlations in proton-proton collisions at LHC energies with the ALICE detector

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Multiple parton interactions are expected to produce large long-range multiplicity correlations in high energy proton-proton and nucleus-nucleus collisions. Color glass condensate models explain the long range forward-backward (F-B) correlations by introducing strong color fields extended longitudinally in rapidity. Clustering of color sources also leads to F-B correlations. The measurement of the long range rapidity correlations of the produced particle multiplicities may give us insight into the space-time dynamics of the early stages of the collision.

We report on short and long-range multiplicity correlations for pp collisions at $\sqrt{s} = 0.9, 2.76$ and 7.0 TeV in the ALICE experiment for minimum bias as well as for high multiplicity events. This measurement utilizes an absolute coordinate system and preserves the actual spatial separation of the particles. The F-B correlation strengths at 7 TeV for minimum bias events are compared to those of 0-10% Au+Au collisions at 0.2 TeV from RHIC. Comparison to different event generators will be made. Beam energy dependence of the correlation strengths from ISR, Fermilab to LHC energies will be presented.

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