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Forward-backward multiplicity correlations in pp collisions with the ALICE detector

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The strength of forward-backward (FB) multiplicity correlations is measured by the ALICE detector in proton-proton collisions at $\sqrt{s} = 0.9$, 2.76 and 7 TeV.
Such correlations are considered to be a powerful tool for the exploration of the initial conditions of hadronic interactions.
The measurement is performed in the central pseudorapidity region ($|\eta| < 0.8$) for the charged tracks with transverse momentum $p_{\mathrm{T}} > 0.3$ GeV/c.
Two separate pseudorapidity windows of width ranging from 0.2 to 0.8 are chosen symmetrically around $\eta = 0$.
The multiplicity correlation strength (b_{corr}) is found to decrease with increasing pseudorapidity gap
and shows a non-linear increase with the width of these windows.
A sizable increase of the correlation strength with the collision energy is observed.
The correlation coefficient is also measured for multiplicities
in different configurations of two azimuthal sectors selected within the symmetric FB η-windows.
Two different contributions, short-range (SR) and long-range (LR), are observed.
The energy dependence of b_{corr} is found to be weak for the SR component while it is strong for the LR component.
Moreover, the correlation coefficient is studied for particles belonging to various transverse momentum intervals chosen to have the same mean multiplicity.
Both SR and LR contributions to b_{corr} are found to increase with p_{T} in this case.
Results are compared to PYTHIA and PHOJET event generators and to a string-based phenomenological model.
The observed dependencies of b_{corr}
add new constraints on phenomenological models.

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