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Forward-backward correlations between multiplicities and event-mean transverse momenta in pp and Pb-Pb collisions with ALICE

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Forward-backward (FB) correlations are usually measured between observables obtained in an event-by-event analysis in two separated pseudorapidity intervals. Such correlations are considered to be a powerful tool for the exploration of the initial conditions of hadronic interactions. The conventional observable for the FB correlations analysis is the charged particle multiplicity. FB correlations between multiplicities were measured by ALICE
in pp collisions at $\sqrt{s} = 0.9$, 2.76 and 7 TeV. For Pb-Pb collisions, besides the multiplicity, we studied FB correlations using an intensive observable, namely the event-averaged transverse momentum of particles measured in each of the two pseudorapidity intervals. The strength of the FB correlations between event-mean transverse momenta is robust against volume fluctuations and thus the centrality determination methods, which provides higher sensitivity of this quantity to the properties of the initial state and evolution of the medium created in AA collisions. The magnitude of the FB correlation strength is obtained at different centralities of the Pb-Pb collisions measured at $\sqrt{s_{\rm NN}} = 2.76$ and 5.02 TeV with the ALICE detector. Results are compared to event generators and to a Monte Carlo model with fusion of quark-gluon strings.

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Fluctuation in initial conditions, collective flow and correlations

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Session Classification: Charge fluctuations, correlations and balance functions