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Very forward energy emission as a function of particle production at midrapidity in pp and p-Pb collisions with the Zero Degree Calorimeters of ALICE

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Using the ALICE Zero Degree Calorimeters (ZDC) it is possible to study the very forward charged and neutral energy in pp and p-Pb collisions. By correlating these measurements with the midrapidity particle production, one obtains new direct insights into the initial stages of the collisions. New results on the energy detected in neutron and proton ALICE ZDC in pp collisions at $\sqrt{s}$ = 13 TeV will be discussed and compared with results for the proton breakup in p-Pb collisions at $\sqrt{s_{\rm NN}}$ = 8.16 TeV. These measurements, performed for the first time at LHC, cover over 18 units of pseudorapidity.

Studying correlations between high-$p_{\rm T}$ particles at midrapidity and the forward energy provides complementary information to the underlying event (UE) measurements, which are usually interpreted in the framework of models implementing centrality dependent MPI production. The results will be compared with the expectations of several hadronic interaction models. These new measurements provide fundamental indications on the validity of models in describing the beam remnants at very-forward rapidities, where perturbative QCD cannot be used.

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