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Measuring The Fraction of Electromagnetic Energy as Probe Collective Effects in p-p Collisions at 13 TeV.

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Abstract

The very forward region ($-6.6 \leq \eta \leq -5.2$) is covered by CASTOR detector, that region cannot be covered by CMS experiment. As a function of pseudorapidity, a measurement of the fraction of electromagnetic energy used to explore collective effects in proton-proton collisions at energy $\sqrt{s} = 13$ TeV is reported. Data was compared using various Monte Carlo generators. In contrast to the data, each model under consideration suggests a distinct form for the pseudorapidity dependence. Additionally, systematic studies have also been performed. Further sources of uncertainties related to detector and analysis were found and quantified. It was shown that the calorimeters of CMS taken all together and covering a very wide eta range from $|\eta|$ to $|6.6|$ may well be suited to provide further insights into hadronization and collective effects even in Zero Bias p-p collisions. Several comparisons with MC simulations show that the facts are well-described. Also, MC was utilized to calculate the correction factors from detector-level to particle-level.