

Nonstatistical moments in high-energy pp collisions

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One main goal of heavy ion collision experiments is to locate the critical point in the QCD phase diagram. Signatures of the critical point may be related to the fluctuation of event-by-event observables. Various moments of observables, such as the mean (\mathbf{M}), standard deviation (σ), skewness (\mathbf{S}) and kurtosis (κ) are expected to be among the tools necessary to reveal the mystery of the critical point. In this work the parton and hadron cascade model, PACIAE 2.0 [1], is employed to calculate the nonstatistical moments and moment products ($\mathbf{S}\sigma$ and $\kappa\sigma^2$) of antiproton distributions in pp collisions from RHIC energy up to LHC energy. It is found that the nonstatistical moments and moment products of antiproton are sensitive to the collision energy and change rapidly at $\sqrt{s} \sim 1000$ GeV.

[1] B. -H. Sa et al., Comput. Phys. Commun. **183**, 333 (2012).

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