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## A comparative study of high multiplicity $pp$ and heavy ion collision using $q$ -Weibull distribution function

One of the primary goals of ongoing and upcoming particle physics experiments is the study of QCD matter created under extreme condition of temperature and energy density called Quark Gluon Plasma (QGP). Earlier, it was believed that the QGP formation takes place only in heavy ion collision whereas the  $pp$  collision is being used as a baseline to study the QGP state is heavy ion collision. However, recent results from high multiplicity  $pp$  collision at LHC reported certain effects that are so far considered typical to heavy ion collision. ALICE experiment result on strangeness enhancement may signal the formation of QGP like state in high multiplicity  $pp$  collision. These results opens up a new avenue in high energy physics to search for the QGP state. With the availability of high multiplicity  $pp$  collision data at different multiplicities and energies, it will be interesting to analyze the variation of thermodynamical properties with multiplicity in  $pp$  collision and compare it with the data from heavy ion collision.

One of the thermodynamical property is the non extensive parameter  $q$ , which indicates how much a system deviate from thermal equilibrium. We will present a comparative study of parameter  $q$  extracted using the transverse momentum ( $p_T$ ) spectra of charged hadrons produced in high multiplicity  $pp$  and heavy ion collision. We will discuss the results related to  $p_T$  range dependent variation of parameter  $q$  with multiplicity for different collision system and energies.

### Field of contribution

Phenomenology

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