



Contribution ID: 48

Type: Oral presentation

Study of thermodynamic variables in high-energy collisions using Tsallis Statistics

Thursday 12 October 2023 14:30 (20 minutes)

High-energy collisions allow us to study the behaviour of matter at high temperature and density. Various experimental signatures suggest that a new state of matter called Quark-Gluon Plasma (QGP) is produced in heavy-ion collisions. However, recent results suggest that high-multiplicity $p+p$ collisions might also be able to produce QGP droplets. Therefore, there is a pressing need to gain deeper insights into $p+p$ collisions to understand the properties of the produced system. Tsallis statistics is a non-extensive statistical mechanics framework that has been used to successfully describe a wide range of complex systems, including high-energy collisions. We use thermodynamically consistent Tsallis statistics to study the charged hadron spectra from $p+p$, $p+Pb$, $Xe+Xe$, and $Pb+Pb$ collisions at the LHC.

In this talk, we will show the system size dependence of various thermodynamic variables at the kinetic freeze-out (KFO) surface. Our results show that the rate of increase (or decrease) with system size of various thermodynamic variables is more rapid in small systems such as $p+p$ and $p+Pb$ collisions than in large systems such as $Xe+Xe$ and $Pb+Pb$ collisions. Moreover, we also find that the magnitudes of different thermodynamic variables in high-multiplicity $p+p$ collisions are comparable to those in peripheral heavy-ion collisions.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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