



Contribution ID: 95

Type: **Talk**

## Particle production in high-energy collisions and generalized non-additive distributions

*Tuesday 3 September 2024 17:25 (20 minutes)*

Particle spectra of the hadrons produced during high-energy collisions have a power-law tail, and there are many studies showing that the distribution of the hadrons can be described using the quasi-exponential distribution derived from the non-additive (a.k.a. non-extensive) statistical mechanics proposed by C. Tsallis. Such a power-law behaviour can arise in systems (e.g. the Quark-Gluon Plasma/QGP) with fluctuations (e.g. in temperature), long range correlations, and finite system size. Such physical scenarios are manifested in the global observables like transverse momentum spectra measured at kinetic freeze-out indicating that a generalized statistical description beyond the Boltzmann-Gibbs statistics is essential.

In this report, we show how a closed, analytical form of a generalized non-additive single-particle distribution providing a description of hadrons in high-energy collisions can be obtained by considering a single-mode harmonic oscillator. This method is an improvement over the earlier results containing a series summation that diverges when arbitrarily large number of terms are involved. Physical implications of our results while describing particle production in high-energy collisions will also be discussed.

### Internet talk

No

### Is this an abstract from experimental collaboration?

No

### Name of experiment and experimental site

N/A

### Is the speaker for that presentation defined?

Yes

### Details

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**Session Classification:** Heavy Ion Collisions and Critical Phenomena

**Track Classification:** Main topics: Heavy Ion Collisions and Critical Phenomena