

# Tsallis fits of $p_T$ distributions in double gap events

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Diff PAG meeting, june 24, 2021

## Analysis source parameters

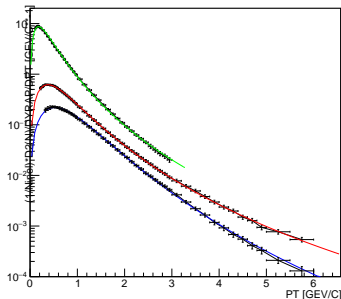
- compare source characteristics of double gap events to min bias events at same mult. by Levy-Tsallis fit of  $p_T$ -spectra
- Possible generalization of Boltzmann-Gibbs statistics  
C.Tsallis, J.Statist. Phys. 52, 479 (1988).
  - ▶ exponential distribution at low  $p_T$
  - ▶ power law distribution at high  $p_T$
  - ▶ fits very well to  $p_T$ -distributions measured at RHIC and LHC
  - ▶ general form  $\frac{dN}{dyd^2p_T} \propto \frac{dN}{dy} \left(1 + \frac{m_T - m}{nT}\right)^{-n}$ 
    - $n=1/(q-1)$ , assoc.  $T$  with temperature
    - $n=q/(q-1)$ , assoc.  $qT$  with temp., recommended by J.Kapusta
- Transverse Momentum Distributions in Proton-Proton Collisions at LHC Energies and Tsallis Thermodynamics  
M.D.Azmi and J.Cleymans, arXiv: 1401.4835.
- Perspective on Tsallis Statistics for Nuclear and Particle Physics, J.Kapusta, arXiv: 2106.06824.

# ALICE measurements

- Measurement of pion, kaon and proton production in proton-proton collisions at  $\sqrt{s} = 7$  TeV

ALICE Coll., EPJC 75 (2015) 226, arXiv: 1504.00024.

doi:10.17182/hepdata.68129.v1/t1



- Levy-Tsallis fits:

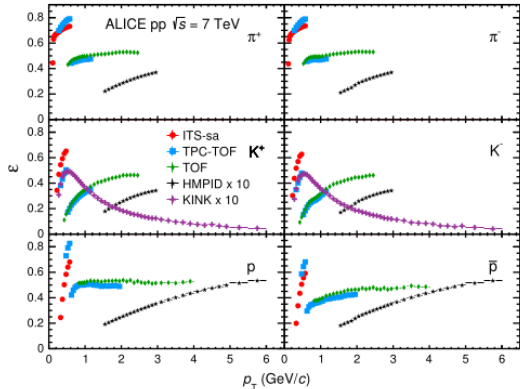
- ▶  $p_T(\pi^+ + \pi^-)$
- ▶  $p_T(K^+ + K^-)$
- ▶  $p_T(p + \bar{p})$

- Tsallis fits  $p_T$ -spectra  $\pi, K, p$  measured in double gap events?  
→ Comparison source parameters:  
ratios of  $\pi/p, K/p, \pi/K$ , q-(Tsallis) temperatures

# ALICE measurements

## ■ correction of raw data ALICE measurements:

**Fig. 11** Correction factors [ $\epsilon(p_T)$  in Eq. 2] for  $\pi^+$ ,  $K^+$  and  $p$  (left panel) and their antiparticles (right panel) accounting for PID efficiency, detector acceptance, reconstruction and selection efficiencies for ITS-sa (red circles), TPC-TOF (light blue squares), TOF (green diamonds), HMPID (black stars) and kink (purple crosses) analyses



- any showstoppers kink analysis  $K^+$ ,  $K^-$  in double gap events?
- HMPID readout always, only in special runs?