



High Energy Physics - Phenomenology

# The Tsallis Distribution and Transverse Momentum Distributions in High-Energy Physics

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The Tsallis distribution has been used recently to fit the transverse momentum distributions of identified particles by the STAR collaboration \cite{Abelev:2006cs} at the Relativistic Heavy Ion Collider and by the ALICE \cite{Aamodt:2011zj} and CMS \cite{Khachatryan:2011tm} collaborations at the Large Hadron Collider. Theoretical issues are clarified concerning the thermodynamic consistency of the Tsallis distribution in the particular case of relativistic high energy quantum distributions. An improved form is proposed for describing the transverse momentum distribution and fits are presented together with estimates of the parameter  $q$  and the temperature  $T$ .

Comments: 10 pages, 4 figures

Subjects: **High Energy Physics - Phenomenology (hep-ph)**; Nuclear Theory (nucl-th)

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