

Non Boltzmann-Gibbs ensembles in hadronic production processes

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Recently one notices increasing interest in fluctuations observed in production processes. I shall argue that they can be accounted for by employing non Boltzmann-Gibbs ensembles in statistical models of hadronization used to describe hadronic production processes like Tsallis q -statistics [1] or extended Gaussian ensemble approach (EGE) [2]. Nonextensivity parameter $q = q_L$ describing data in longitudinal phase space is given by the event-by-event fluctuations of the number of produced secondaries, responsible for broadening of the corresponding multiplicity distributions from the Poissonian to Negative Binomial form [1,3]. Similarly, parameter $q = q_T$ allows for description of the transverse momentum distributions in the whole observed range of p_T [4] and measures intrinsic fluctuation of temperature T of hadronizing system. To study the possible event-by event fluctuations of the energy used for production of observed secondaries one needs the EGE approach [2]. The hydrodynamical models of multiparticle production can also be modified along the same lines accounting for intrinsic fluctuations in hadronizing systems not considered before (originating from the turbulent flow characteristic for non-abelian fields) [5].

1. F.S. Navarra et al., Physica A344 (2004) 568.
2. T. Osada et al. Eur. Phys. J. B50 (2006) 7.
3. G.Wilk and Z.Wlodarczyk, cond-mat/0603157.
4. M.Biyajima et al., hep-ph/0602120.
5. T.Osada and G.Wilk, in preparation.