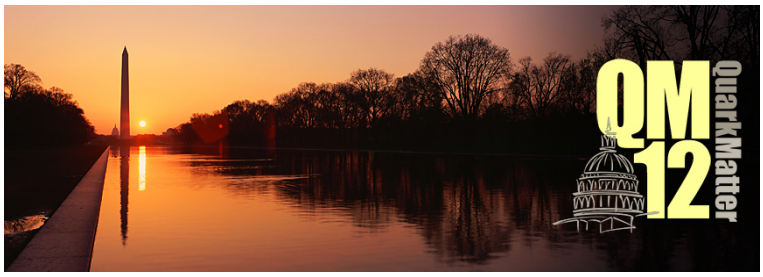

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Getteing primordial baryon number fluctuation from observed proton number fluctuation in relativistic heavy ion collisions

Thursday, 16 August 2012 16:00 (2 hours)

We explore the relation between proton and nucleon numberfluctuations in the final state in relativistic heavy ion collisions. It is shown that the correlations between the isospins of nucleons in the final state are almost negligible over a wide range of collision energy. This leads to a factorization of the distribution function of the proton, neutron, and their antiparticles in the final state with binomial distribution functions. Using the factorization, we derive formulas to determine nucleon number cumulants, which are not direct experimental observables, from proton number fluctuations which are experimentally observable in event-by-event analyses.
With a simple treatment for strange baryons, the nucleon number
cumulants are further promoted to the baryon number ones.
Experimental determination of the baryon number cumulants makes
it possible to compare various theoretical stduies on them directly with experiments. Effects of nonzero isospin density on this formula are addressed quantitatively. It is shown that the effects are well suppressed over a wide energy range.

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