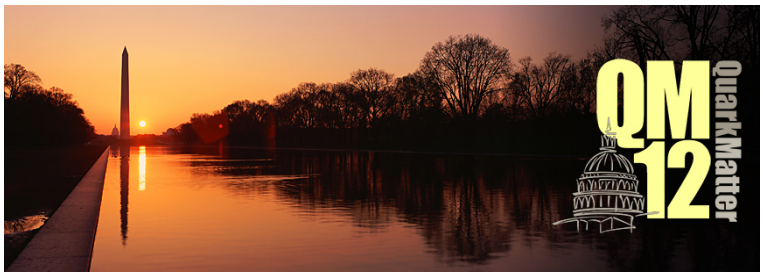

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Higher moments of net-charge multiplicity distributions at RHIC energies from STAR

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

To prob e the critical p oint (CP) of QCD phase transition, the Relativistic Heavy-Ion Collider (RHIC) at Brookhaven National Laboratory has
undertaken the beam energy scan program, colliding high energy heavy-ions
corresponding to baryonic chemical potentials within the range of 20 - 550
MeV. QCD based model calculations reveal that the correlation length of the
system diverges at the CP. The higher order moments (such as standard deviation (σ), skewness (S) and kurtosis (κ)) of the net-charge, net-baryon and
net-strangeness multiplicity distributions are related to the corresponding
higher order susceptibilities and also to the correlation length of the system.
The non-monotonic behavior of these higher moments as a function of colliding energy could be considered as a signal of the CP.

The STAR experiment has taken data for Au+Au collisions at 200 GeV,
62.4 GeV, 39 GeV, 27 GeV, 19.6 GeV, 11.5 GeV and 7.7 GeV center of
mass energies. Here we report the mid-rapidity measurement of the higher
order moments of the net-charge multiplicity distribution using the STAR
time projection chamber detector for above beam energies. The energy and
centrality dependence of higher moments and their products (such as $\frac{\sigma^2}{M}$, $S\sigma and \kappa\sigma\^{2}$) will be presented. The data will also be compared to Poisson expectations and Hadron Resonance Gas model calculations

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