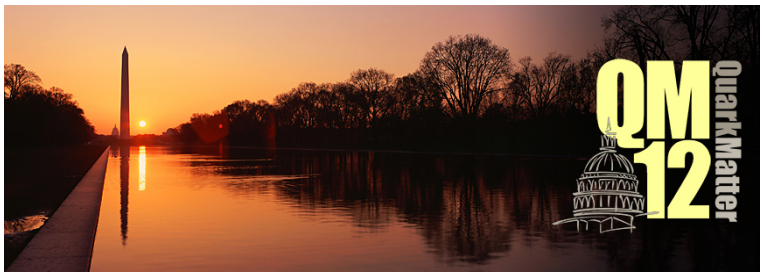

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Measurement of net-charge fluctuations by ALICE at the LHC

Thursday, August 16, 2012 4:00 PM (2 hours)

Charge fluctuations are considered to provide a possible signature for the existence of the de-confined Quark Gluon Plasma phase (QGP). Charge fluctuations are sensitive to the number of charges in the system, thus the fluctuations in the QGP, with fractionally charged partons, are significantly different from those of hadron gas with unit charged particles. The study of charge fluctuations have been carried out by using the variable, $\nu(+-,dyn)$ which, by its construction, is free from the collisional bias, i.e., impact parameter fluctuations and fluctuations from the finite number of charged particles within the detector acceptance. The dependence of charge fluctuations on the rapidity windows for various centrality bins are analyzed for Pb+Pb collisions at $\sqrt{s}NN$ = 2.76 TeV in the ALICE experiment at CERN-LHC. Furthermore the higher moments of net-charge distribution are examined. It has been demonstrated that higher moments as well as moment products are sensitive to the correlation length and directly connected to the thermodynamic susceptibilities computed in the Lattice QCD.

We observe that the dynamical fluctuations, measured in terms of $\nu(+-,dyn)$, decrease while going from peripheral to central collisions. We examine the dependence of fluctuations, using the D-measure, on the pseudorapidity interval $\Delta\eta$, which may account for the dilution of fluctuations during the evolution of the system. The higher moments like mean, sigma (σ), skewness (S), kurtosis (K) and the quantities like $S\sigma$ and $K\sigma 2$ of net-charge are estimated as a function of centrality. The experimental values are compared to the theoretical expectations for a hadron gas and a Quark Gluon Plasma (QGP). The results will be shown and discussed.

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