



Contribution ID: 167

Type: Oral Presentation

Search for QCD Phase Transitions and the Critical Point Utilizing Particle Ratio Fluctuations and Transverse Momentum Correlations from the STAR Experiment.

Tuesday, August 14, 2012 4:45 PM (20 minutes)

Dynamical fluctuations in globally conserved quantities such as baryon number, strangeness, charge, and isospin are suggested to carry information about the de-confinement and chiral phase transitions. An observation of enhanced dynamical fluctuations or non-monotonic behavior of transverse momentum correlations as a function of colliding energy might indicate the system has probed the predicted QCD critical point.

The STAR experiment has performed a comprehensive study of the energy and charge dependence of dynamical particle ratio (K/π , p/π , and K/p) fluctuations, net-charge fluctuations, and transverse momentum correlations in the STAR TPC at mid-rapidity, as well as neutral-charge pion fluctuations at forward rapidity. The charge dependence of particle ratio fluctuations exhibit differences between same and opposite sign dynamical particle ratio fluctuations compared to inclusive charged dynamical fluctuations. Neutral-charge pion fluctuations at forward rapidity are measured by detecting neutral pion decay photons in the Photon Multiplicity Detector and charged pions by the Forward Time Projection Chamber, which cover the same pseudorapidity region.

The centrality, energy, and charge dependence from new measurements of the fluctuation observables ν_{dyn} and $r_{m,1}$ and the energy dependence of transverse momentum correlations from $\sqrt{s_{NN}} = 7.7-200$ GeV Au+Au collisions will be presented. These results are also compared to theoretical predictions from models such as HIJING and UrQMD.

Primary author: Mr TRIBEDY, Prithwish (for the STAR collaboration)

Presenter: Mr TRIBEDY, Prithwish (for the STAR collaboration)

Session Classification: Parallel 2C: Correlations & Fluctuations (Chair X. Dong)

Track Classification: Correlations and fluctuations