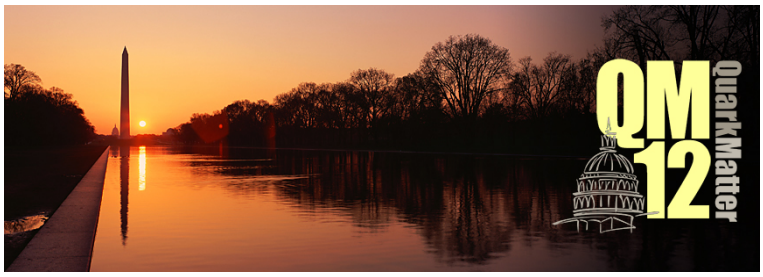

Contribution ID: **305** Type: **Poster**

Pion-Kaon Femtoscopy at $\sqrt{s_{NN}}$ = 200 GeV collisions in STAR at RHIC

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

Correlations between non-identical particles at low relative momentum in the center of mass ($|\vec{k}^*|$) encode unique information on the space-time structure of the emitting system. In addition to size of the homogeneity region, analysis of correlation functions in the three-dimensional $\vec{k}^*$ space can reveal a space-time offset of one particle species (e.g. kaons) with respect to another (e.g. pions). Early results from STAR at $\sqrt{s_{NN}}$ = 130 GeV showed such an asymmetry, which was consistent with collective radial flow. This early analysis was hampered by the limited particle identification capabilities of the STAR Time Projection Chamber, as well as from marginal statistics and photon conversion due to a significant material budget close to the beam. In year 2010 and year 2011, STAR had accumulated more than one billion minimum bias events at $\sqrt{s_{NN}}$ = 200 GeV Au+Au collisions with full Time of Flight detector in operation, which enables detailed non-identical femtoscopy measurements.

We present new measurements of pion-kaon correlations in the more sensitive spherical harmonic decomposition representation at $\sqrt{s_{NN}}$ = 200 GeV collisions from these data sets with a lower material budget and much higher statistics. The analysis greatly benefits when information from the STAR Time of Flight detector is used to extend particle identification capabilities. Centrality dependence of pion-kaon femtoscopy in Au+Au collisions will be presented for the first time. Finally, we present a first similar analysis of p+p collisions at $\sqrt{s}$ = 200 GeV.

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