Abstract Submitted
for the DNP10 Meeting of
The American Physical Society

Measurement of Charge Asymmetry Correlations in High Energy Heavy Ion Collisions[1] QUAN WANG, Purdue University, STAR AT RHIC COLLABORATION — A possible manifestation of local parity violation in relativistic heavy-ion collisions is the event-wise separation of positive and negative charge along the direction perpendicular to the reaction plane. A direct consequence of this separation is a reduction in the correlation between the multiplicity asymmetries of positive($A_{+,UD}$) and negative($A_{-,UD}$) particles in the up and down hemispheres(UD) separated by the reaction plane, and an enhancement in the variances of $A_{\pm,UD}$. The reduction and/or enhancement in the up and down direction is compared to the reference asymmetry correlations in the left and right hemispheres(LR) separated by the plane normal to the reaction plane ($A_{+,LR}$ and $A_{-,LR}$). This talk reports the above correlations in Au+Au and d+Au collisions at 200 GeV measured by the STAR experiment at RHIC. The correlations are found to be significant and can be negative, reflecting the presence of charge (anti-)correlations unrelated to the local parity violation. It is further found that the UD correlations are always larger than LR correlations. These differences between UD and LR have important implications on the proposed local parity violation in the strong interaction.

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Date submitted: 01 Jul 2010 Electronic form version 1.4