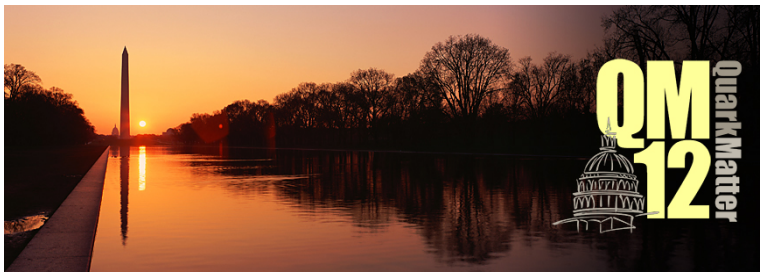

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Forward azimuthal correlations in 200 GeV p+p and d+Au collisions at STAR

Wednesday, 15 August 2012 12:20 (20 minutes)

The proton gluon distribution function increases rapidly with decreasing x at fixed Q^2, but cannot increase indefinitely as x goes to 0. Gluon saturation is expected at a low x value when gluon recombination balances gluon splitting. The nuclear (with atomic mass number A) gluon distribution is approximately $A^{1/3}$ larger than the nucleon gluon distribution function at the same x [1]. STAR is sensitive to x between 0.001 and 0.02 for the nuclear gluon distribution via di-jet measurements with calorimeter subsystems covering -1 < eta < 4. The STAR collaboration has measured forward $\pi 0$-$\pi 0$ correlations and forward+mid-rapidity correlations in p+p and d+Au collisions at $\sqrt{s} = 200GeV$. The suppression of the away-side peak observed in forward-forward correlations in central d+Au collisions is consistent with the CGC expectation [2,3]. Such suppression does not appear in the forward+mid-rapidity correlations.

The Endcap Electromagnetic Calorimeter (EEMC) at STAR covers pseudo-rapidity between 1.08 and 2, providing the opportunity to probe gluons at intermediate x via forward+near-forward correlations. Azimuthal correlations between $\pi 0$ in the Forward Meson Spectrometer (FMS) and jet-like clusters in the EEMC are sensitive to the nuclear gluon distribution in 0.003<x<0.02 region. Together with the forward+forward correlations and forward+mid-rapidity correlations, we will be able to determine the sharpness of the transition along x from a dilute parton gas to the expected CGC state at low Q^2. In this talk, we will focus on FMS-π^0 + EEMC-jet-like-cluster azimuthal correlations in p+p and d+Au collisions. The impact from underlying-event contributions to the jet-like clusters and effective p+Au results, via a deuteron-beam-facing neutron tag, will be discussed as well.

[1] H. Kowalski, D. Teaney, Phys. Rev. D 68, 114005, 2003.
[2] E. Braidot, arXiv:1005.2378, 2010.
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Primary author: LI, Xuan (Shandong University)

Presenter: LI, Xuan (Shandong University)

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