Contribution ID: **113** Type: **not specified**

Recent STAR results and future prospects of the W boson program at RHIC at BNL

Tuesday 27 March 2012 16:30 (30 minutes)

The STAR experiment at the Relativistic Heavy-Ion Collider at Brookhaven National Laboratory is carrying out a spin physics program in high-energy polarized proton collisions at $\sqrt{s} = 200$ GeV and $\sqrt{s} = 500$ GeV to gain a deeper insight into the spin structure and dynamics of the proton. The completion of the first $\sqrt{s} = 500$ GeV polarized proton run in 2009 opened a new era of spin-flavor structure measurements from $W^{-(+)}$ boson production. $W^{-(+)}$ bosons are produced in $\bar{u} + d\,(\bar{d} + u)$ collisions and can be detected through their leptonic decays, $e^- + \bar{\nu}_e\,(e^+ + \nu_e)$, where only the respective charged lepton is measured. The discrimination of $\bar{u} + d\,(\bar{d} + u)$ quark combinations requires distinguishing between high p_T $e^{-(+)}$ through their opposite charge sign, which in turn requires precise tracking information. Recent published STAR results on the first measurement of W^-/W^+ and Z boson production will be shown.

The STAR experiment has recently started the installation of the Forward GEM Tracker to enhance the charge separation of high p_T $e^{-(+)}$ at forward pseudorapidities and will begin the commissioning of this new tracking system during the upcoming 2012 running period. The status of the Forward GEM Tracker along with a discussion of future prospects will be presented.

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Session Classification: Spin physics

Track Classification: Spin physics