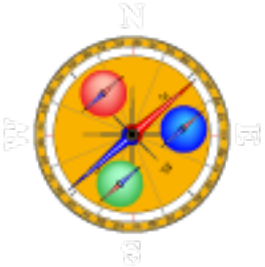

Contribution ID: **71** Type: **not specified**

Transverse single-spin asymmetries in p p ! W(Z0) X at RHIC

Thursday, 14 December 2017 15:00 (25 minutes)

The three-dimensional structure of the proton in momentum space can be described via Transverse Momentum Dependent (TMDs) parton distribution functions. One of these TMDs, known as the Sivers function f⊠1T, describes the correlation of parton transverse momentum with the transverse spin of the nucleon. RHIC is the worlds only facility that can run polarized p+p collisions at a center-of-mass energy large enough to produce weak bosons. Accessing the Sivers function in p+p collisions through the measurement of transverse single-spin asymmetry, AN, in weak boson production is an effective path to test the fundamental QCD prediction of its change of sign (non universality) respectively to e+p processes. Furthermore, it provides data to study the spin-flavor structure of valence and sea quarks inside the proton and to test the evolution of parton distributions. AN has been measured at STAR in p+p collisions at √s = 500 GeV, with a recorded integrated luminosity of 25 pb 1. Within relatively large statistical uncertainties, the current data favor theoretical models that include change of sign for the Sivers function relative to observations in SIDIS measurements, if TMD evolution effects are small. STAR has just collected 350 pb 1 from transversely polarized p+p collisions in run 2017. This will allow us to perform a more precise measurement of AN in both weak boson and Drell-Yan production as well as other observables sensitive to the non-universality of the Sivers function via the Twist-3 formalism, e.g. AN of direct photons.

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Session Classification: Session IV-c