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Recent STAR results and future prospects of $W^{-(+)}$ boson production in polarized p+p collisions at RHIC

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The RHIC spin physics program has in 2009 completed the first data taking period of polarized p+p collisions at $\sqrt{s}=500$ GeV. This opens a new era in the study of the spin-flavor structure of the proton based on the production of $W^{-(+)}$ bosons. $W^{-(+)}$ bosons are produced in $u\bar{d}, (d\bar{u})$ 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 $u\bar{d}$ and $d\bar{u}$ quark combinations requires distinguishing the charge sign of high p_T electrons and positrons, which in turn requires precise tracking information. At mid rapidity, STAR relies on the existing Time Projection Chamber. At forward rapidity, new tracking capabilities will be provided by the Forward GEM Tracker, consisting of six triple-GEM detectors which are under construction. The suppression of QCD background over W boson signal events by several orders of magnitude is accomplished by using the highly segmented STAR Electromagnetic Calorimeters to impose isolation criteria suppressing jet events, and vetoing di-jet events based on the measured away side energy.

Recent STAR results on the first measurement of $W^{-(+)}$ boson production in polarized p+p collisions will be shown along with a discussion of future prospects involving the STAR Forward GEM Tracker.

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