

Abstract Submitted
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Prospects of polarized Drell-Yan experiments¹ KWANGBOK LEE, XIAODONG JIANG, Los Alamos National Laboratory, FERMILAB COLLABORATION, J-PARC COLLABORATION, RHIC COLLABORATION — Drell-Yan spin observable measurements with polarized proton (and/or ^3He) beams provide valuable and unique probes to access the fundamental structure of nucleons. For example, comparing to Semi-Inclusive Deep Inelastic Scattering (SIDIS), double longitudinal spin asymmetries in Drell-Yan reactions provide a clean access to anti-quark helicity distributions without involving quark fragmentation functions. Transverse Single Spin Asymmetry (SSA) in Drell-Yan reactions can test the predicted sign change of quark Sivers function compared to that from SIDIS measurement, providing an important test of the fundamental QCD as well as our current understanding of the transverse spin phenomena. Drell-Yan SSA can also access other quark Transverse Momentum Dependent distributions (TMDs), for example, quark's transversity (h_1), and quark's "longitudinal helicity" (h_{1L}^\perp). We will review several proposed options of polarized beams, such as Fermilab's Main Injector, J-PARC and RHIC and will discuss the prospects and physics sensitivities of double-spin and single-spin Drell-Yan observable measurements through detailed Monte Carlo simulations.

¹Los Alamos National Laboratory

Kwangbok Lee
Los Alamos National Laboratory

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