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Light Anti-quark Asymmetry in E906 Drell-Yan ($p + p(d) \rightarrow \mu^+ + \mu^-$) and prospects of polarized Drell-Yan at Fermilab Main Injector CHIRANJIB DUTTA, University of Michigan, Ann Arbor, E906/SEAQUEST COLLABORATION — The E-906/SeaQuest experiment will measure the Drell-Yan cross section in p-p and p-d scattering and will determine the $\frac{\bar{d}}{\bar{u}}$ asymmetry over 0.04 $<$ x $<$ 0.45, thus extending the available E-866 measurements to a higher x region. The experiment will use the 120 GeV/c proton beam extracted from the Fermilab Main Injector on liquid hydrogen and deuterium targets which will provide a significant improvement in the statistical uncertainty as compared to the predecessor E-866 measurements. The experiment will start taking data in the summer of 2011. Efforts are currently underway to study the feasibility of using the E906 spectrometer together with a polarized proton beam in the Main Injector or/and a polarized proton target for polarized Drell-Yan scattering. This would allow to measure the transverse momentum dependent degrees of freedom in the nucleon via single spin asymmetries (SSA). The most anticipated result from polarized Drell-Yan will not only complement existing results from SIDIS measurements, but also serve as an independent check of a fundamental prediction of QCD. The current status of preliminary data taking as well the expected results from E906/SeaQuest experiment will be addressed. The physics motivation and the prospects of the next generation polarized Drell-Yan experiment in Fermilab will be discussed.

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