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Probing Valence Quark's Sivers' Distribution with Polarized-Beam Drell-Yan[1]

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The E-906/SeaQuest experiment at Fermilab is collecting unpolarized Drell-Yan and J/ψ data. These data will elucidate aspects of the antiquark distributions in nucleon and nuclear structure, including the the flavor asymmetry in the light quark sea and the EMC effect in the sea distributions. Presently, neither the beam nor the target is polarized in SeaQuest. With little or no modification to the spectrometer, the addition of either a polarized target or beam will unleash exciting new opportunities to examine the spin structure of the valence (polarized beam) and sea (polarized target) quark structure of the proton, including the valence and sea quark Sivers' distributions. QCD predicts that the Sivers' distribution measured with polarized Drell-Yan is equal in magnitude but opposite in sign to the Sivers' distribution measured by semi-inclusive DIS. After a review of SeaQuest's current physics program and spectrometer status, this talk will focus on the achievements that will be made with the addition of a polarized beam from the Fermilab Main Injector, including a precise determination of the Sivers' distribution of a wide range of x_{Bj} necessary for this comparison.

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