Abstract Submitted
for the TSS21 Meeting of
The American Physical Society

Polarized Drell-Yan Process to Study Sea Quarks at Fermilab E1039[1] ISLA CASEY, Abilene Christian University — The E1039/SpinQuest collaboration at Fermilab will measure the spin asymmetry in the quark sea. SpinQuest is the continuance of the E906/SeaQuest experiment which has studied the ratio of $\bar{u}$ to $\bar{d}$ in a proton using the Drell-Yan process to measure di-muons from quark-antiquark annihilation. The E1039 project has now upgraded the SeaQuest spectrometer with a polarized target and improved detectors to provide knowledge of the target protons spin. With this upgrade, SpinQuest can now search for a left-right spin asymmetry in Drell-Yan dimuons to make the worlds first measurement of the sea quark Sivers function, a correlation between the transverse momentum of the quark and the protons spin. Should the Sivers function turn out to be equal to zero, the spin of the proton and the transverse momentum of the sea quarks might then be independent of each other. However, if it is non-zero, this will suggest that sea quarks have orbital angular momentum, which may be one of the missing pieces to the proton spin puzzle. This presentation will discuss how the SpinQuest experiment will contribute to the understanding of the Sivers function in sea quarks.

[1]This research was supported by US DOE MENP Grant DE-FG02-03ER41243

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Date submitted: 16 Mar 2021 Electronic form version 1.4