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E1039/SpinQuest Polarized Drell-Yan Experiment at Fermilab

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E1039/SpinQuest is the first transversally-polarized Drell-Yan experiment at Fermilab. SpinQuest data-taking is anticipated to begin this coming fall 2019. In SpinQuest, a transversely-polarized NH3 or ND3 target is employed with the unpolarized 120-GeV extracted proton beam from Fermilab Main Injector to obtain various measurements of transverse single spin asymmetries in J/psi, psi', lambda, di-muon (Drell-Yan) productions without the need to account for final-state fragmentation effects. These measurements shed light on virtual-quark and gluon Sivers functions, and are sensitive to the contribution of virtual quark orbital angular momentum to the nucleon spin, as well as multi-gluon correlation dynamics, respectively.

During the entire beam-off/-on commissioning periods, my primary focus is to bring up our multi-wire proportional chambers, along with tightly related chamber readout electronics and data acquisition system to our final-state detections, ready for the data-taking late this year. E1039 comprises three stations of multi-wire proportional chambers plus one station of proportional tubes. The former is in use of track reconstruction and the determination of track kinematics, while the later is specifically designed for the final-state muon identification. During the no-beam commissioning, we re-organized the chamber gas supply system, inspect/repair chamber wires at Lab 6, set up stand-alone chamber readout electronics test bench at NM4/KTeV experimental hall and turn on high voltages to evaluation the performance of chambers from all stations.

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