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Measurement of the Angular Distributions of Drell-Yan Dimuons BRANDON BOWEN, Abilene Christian University, FERMILAB E-906/SEAQUEST COLLABORATION — The angular differential cross section for the Drell-Yan (DY) process can be parametrized by $\frac{d\sigma}{d\Omega} \propto 1+\lambda\cos^2\theta+\mu\sin 2\theta\cos\phi+\frac{\nu}{2}\sin^2\theta\cos 2\phi$, where λ, μ, and ν are the angular distribution parameters vs p_T. θ and ϕ denote the polar and azimuthal angles, respectively for the positive lepton produced. The Lam-Tung relation, $1-\lambda=2\nu$, was validated by Fermilab E-866 for proton induced Drell-Yan scattering; However pion induced DY shows a much stronger cos2θ angular dependence and a violation of the Lam-Tung relation. In pion induced DY the antiquark is a valance quark, whereas in proton induced DY (in a forward acceptance spectrometer) it is a sea quark, so E-866 probed the antiquark sea of the nucleon. The SeaQuest experiment, also using proton induced DY, will improve on the measurement of the angular dependencies at a lower energy (120 GeV), taking advantage lower backgrounds and an increase in Drell-Yan cross section at lower energies. The Boer-Mulders correlates the quark correlates between the quark transverse spin and momentum. Improved data from SeaQuest will help determine the Boer-Mulders function. Funding for this work was provided in part by the U.S. DOE Office of Science.

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