

Angular Distributions of p+p Induced Drell-Yan Dimuons at Fermilab Experiment 906/SeaQuest

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In two $\pi + W$ induced Drell-Yan experiments at CERN and Fermilab, angular distributions of the resultant dimuons showed a violation of the Lam-Tung relation, a perturbative QCD, “Callan-Gross-like” relationship between the polar and azimuthal angles made by the initial hadronic plane and final state dimuon plane in the Collins-Soper frame. At these energies, the violation manifests itself as a nonzero $\cos(2\phi)$ modulation in dimuon azimuthal distributions, naively suggesting a double spin-flip in a single photon process or a contribution from the Boer-Mulders distribution, a transverse momentum dependent distribution function describing the correlation of motion of unpolarized nucleons with their constituent polarized partons. Fermilab Experiment 866/NuSea saw a Lam-Tung violation in $p+d$ induced Drell-Yan characterized by a smaller $\cos(2\phi)$ dimuon azimuthal modulation while $p+p$ induced Drell-Yan saw results consistent with no violation of the relation. Fermilab Experiment 906/SeaQuest is currently investigating the possible violation of the Lam-Tung relation at a higher target x range than any previous Drell-Yan experiment. Studies of the angular distributions of p+p dimuons in SeaQuest will be presented.