

Measurement of Antiquark Flavor Asymmetry in the Proton by the Drell-Yan Experiment SeaQuest at Fermilab

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The amount of \bar{u} and that of \bar{d} in the proton were assumed to be the same based on the flavor symmetry. However, the NMC experiment at CERN found, by deep inelastic muon scattering, that \bar{d} is dominant in the proton. The previous Drell-Yan experiment at Fermilab (E866) measured the ratio of \bar{d} to \bar{u} , namely flavor asymmetry, and showed that \bar{d}/\bar{u} is as asymmetric as 1.7 at Bjorken $x \sim 0.2$. The E866 experiment also indicated that \bar{d}/\bar{u} rapidly decreased at Bjorken $x \sim 0.3$ although the uncertainty was large. This behavior is not explained by any theories at present. The SeaQuest experiment (E906) at Fermilab aims to clarify the flavor asymmetry in that region. The ratio of \bar{d} to \bar{u} is derived from the cross section ratio of proton-deuteron to proton-proton Drell-Yan process. We use the 120-GeV proton beam extracted from Fermilab Main Injector and two targets such as liquid hydrogen and deuterium. We analyzed the data taken in 2015 and obtained the preliminary result. We found that the \bar{d}/\bar{u} doesn't decrease at Bjorken $x \sim 0.3$.

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