

Abstract Submitted
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Measurement of the $\frac{F_2^n}{F_2^p}$ ratio in the JLab MARATHON experiment MICHAEL NYCZ, Kent State Univ - Kent — The $\frac{F_2^n}{F_2^p}$ structure function ratio has been measured previously from Deep Inelastic Scattering, using proton and deuterium targets to extract the F_2^p F_2^n structure functions respectively as well as the $\frac{d}{u}$ quark distribution function ratio. The lack of a free neutron target has made the extraction of F_2^n challenging due to nuclear corrections, which result in large uncertainties in the $\frac{F_2^n}{F_2^p}$ and $\frac{d}{u}$ quark distribution function in the high x region. Likewise, various theory predictions based on SU(6) symmetry, pQCD, and the diquark model make different predictions for both ratios in the limit $x \rightarrow 1$, all of which fit within the present uncertainty of $\frac{F_2^n}{F_2^p}$ at large x. To avoid the issues related with extracting F_2^n , MARATHON, a experiment currently running in Hall A at Jefferson Lab, used ${}^3\text{He}$ and ${}^3\text{H}$, to extract $\frac{F_2^n}{F_2^p}$ and thus $\frac{d}{u}$ by exploiting the isospin symmetry of the A=3 mirror nuclei. This will result in the determination of the $\frac{F_2^n}{F_2^p}$ and $\frac{d}{u}$ ratios with minimal theoretical uncertainties. This work is supported by NSF Grants PHY-1405814 and PHY-1714809 (Kent State University), and DOE Contract DE-AC05-06OR23177 (JLab)

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