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A new comparison of the F2A/F2p and F2A/F2n structure function ratios¹ NARBE KALANTARIANS, Virginia Union Univ, HOLLY SZUMILAVANCE, CYNTHIA KEPPEL, Thomas Jefferson National Accelerator Facility — Using electron scattering data from SLAC E139 and muon scattering data from NMC in the DIS region, we determine the F2A/F2p and F2A/F2n structure function ratios, spanning $0.3 \leq x \leq 0.8$ and $1 \leq Q^2 \leq 200 \text{ GeV}^2/c^2$. This region is of particular relevance to studies of the EMC Effect. The structure of the free proton is well known from numerous experiments, but the free neutron structure function has remained difficult to access. Recently, the free neutron structure function has been extracted in a systematic study of the global data within a parton distribution function extraction framework and is available from the CTEQ-Jefferson Lab (CJ) Collaboration. In this talk, we leverage the recent global free neutron extraction to introduce a new method to study the EMC Effect in nuclei by re-examining existing data and by now determining the magnitude of the medium modifications to the free neutron and proton structure functions, independently. We further examine the nuclear effects in deuterium and their contribution to our interpretation of the EMC Effect. This talk will summarize the results of the mentioned ratios for the SLAC E139 nuclei using the F2n global data from the CJ Collaboration.

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