Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Bound and Free Nucleon Structure EFRAIN SEGARRA, A. SCHMIDT, Massachusetts Institute of Technology, D.W. HIGGINBOTHAM, Thomas Jefferson National Accelerator Facility, T. KUTZ, Stony Brook University, E. PIASETZKY, Tel Aviv University, M. STRIKMAN, Pennsylvania State University, L.B. WEINSTEIN, Old Dominion University, OR HEN, Massachusetts Institute of Technology — Understanding the partonic structure of the nucleon in the valence region (high xB) is a long standing question. Constraining the neutron-to-proton structure function ratio (F2n/F2p) at high xB has been a goal of many experiments. Many approaches have been made since the 90's towards this, such as neutron structure extractions from proton and deuterium deep inelastic scattering (DIS) measurements. However, how one treats nucleon smearing, off-shell effects, and more, lead to different extractions in the valence region. We present a new model approach to extract the nucleon structure at high xB using all world nuclear DIS data on the proton and on nuclei from deuterium to lead. By consistently accounting for nuclear modification effects, we obtain reduced uncertainty and find a F2n/F2p consistent with predictions such as those of perturbative QCD, but in disagreement with predictions such as the scalar di-quark dominance model. Predictions are also made for F3He/F3H, recently measured by the MARATHON collaboration, the nuclear correction function needed to extract F2n/F2p from F3He/F3H, and the systematic uncertainty associated with this extraction.

Efrain Segarra
Massachusetts Institute of Technology

Date submitted: 26 Jun 2019 Electronic form version 1.4