

The Electron Ion Collider User Group Meeting



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Search for Exotic Gluonic States in the Nucleus

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Although crucial to our understanding of nuclear structure, probes of gluonic components of the nucleus can be elusive, as gluons are accessed only indirectly in deep inelastic scattering. In 1989, Jaffe and Manohar identified a leading-twist double-helicity-flip structure function $\Delta(x, Q^2)$ which is sensitive to exotic gluonic states in the nucleus, and is accessible via an inclusive measurement on a transversely polarized nucleus of spin greater than or equal to 1. We are developing an experiment at Jefferson Lab using a transversely polarized ^{14}N target and the CEBAF 12 GeV electron beam, which would represent the first exploration of the Δ structure function. While the Jefferson Lab experiment will probe Δ from from x of 0.3 to 0.05, the vast kinematic reach of an EIC would allow a thorough probe of this quantity. Such an investigation would directly address the facility's mission to better understand the glue. We will discuss the impact of exciting new lattice QCD results on this quantity from our collaborators, our proposal to measure $\Delta(x, Q^2)$ at JLab, and what a future measurement might look like at the EIC.

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Session Classification: Novel Observables