

The Electron Ion Collider User Group Meeting



Contribution ID: 29

Type: **not specified**

Exotic Glue: The Gluonic Transversity Structure Function

Friday, 8 July 2016 13:30 (25 minutes)

In 1989 Jaffe and Manohar described a leading-twist, double-helicity-flipping structure function $\Delta(x, Q^2)$ which is sensitive to gluonic states in any hadron of spin $J \geq 1$, notably in nuclei. For nuclei, this quantity gives a measure of exotic glue—the contributions from gluons not associated with individual nucleons in a nucleus—as neither nucleons nor pions (nor any state with spin less than one) can transfer two units of helicity to the nuclear target. In hadrons this quantity is also of particular interest since, unlike the unpolarised and helicity gluon distributions, the transversity density is a clean measure of gluonic degrees of freedom as it only mixes with quark distributions at higher twist. I will summarize the results of the first lattice QCD study of $\Delta(x, Q^2)$, namely a calculation of its low moments in hadronic targets. The robust result allows an investigation of the gluonic structure of hadrons more generally, including consideration of the direct gluonic analogue of the Soffer bound for transversity. The work can be extended to light nuclei as well as to off-forward gluon transversity matrix elements in the nucleon. An experimental measurement of $\Delta(x, Q^2)$ has been proposed in a recent letter of intent to Jefferson Lab, with the goal of measurements at low Bjorken- x on nitrogen targets. Measurements on a variety of light nuclear targets at the Electron-Ion Collider would be of great interest.

Presenter: SHANAHAN, Phiala

Session Classification: Novel Observables