

## Projected High Precision Measurements on the Spin Structure $g_1$ at EIC

The spin structure function  $g_1$  is important for understanding the quark spin contribution to the overall spin of nucleons, which has been a long standing puzzle in nuclear physics. Through the  $Q^2$  dependence of  $g_1$ , the structure function is also sensitive to the gluon spin contribution. In addition, it is important for testing the Bjorken sum rule and can provide a unique way of obtaining the strong coupling constant.  $g_1$  can be measured via the longitudinal and transverse double spin asymmetry in polarized deep inelastic scattering, which has been tested at various fixed target experiment in the past. However, to better address the current opened QCD questions as raised earlier, polarized data with wider kinematic coverage reaching low  $x$  and high  $Q^2$  region are needed. The ePIC detector at the future Electron Ion Collider aims to measure high precision  $g_1^p$  and  $g_1^n$  from  $ep$  DIS and  $e^3\text{He}$  DIS uncovering a large fraction of this previously unexplored area. The details of the experiment and measurement methods will be discussed in this presentation, along with a quantitative projected results estimated using the latest detector simulation and analysis.

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