g_T Impact Study Results

In collaboration with:

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Data and Error Estimates

Data: $\frac{d\sigma_{LT}}{dxdQ^2} = \frac{16\pi\alpha_{em}^2 xy\sqrt{1-y}M^2}{Q^5} g_T,$

using WW relation: $g_T^{(\tau 2)}(x,Q^2) = \int_x^1 \frac{dz}{z} g_1^{(\tau 2)}(z,Q^2)$

proton + deuteron + helium targets

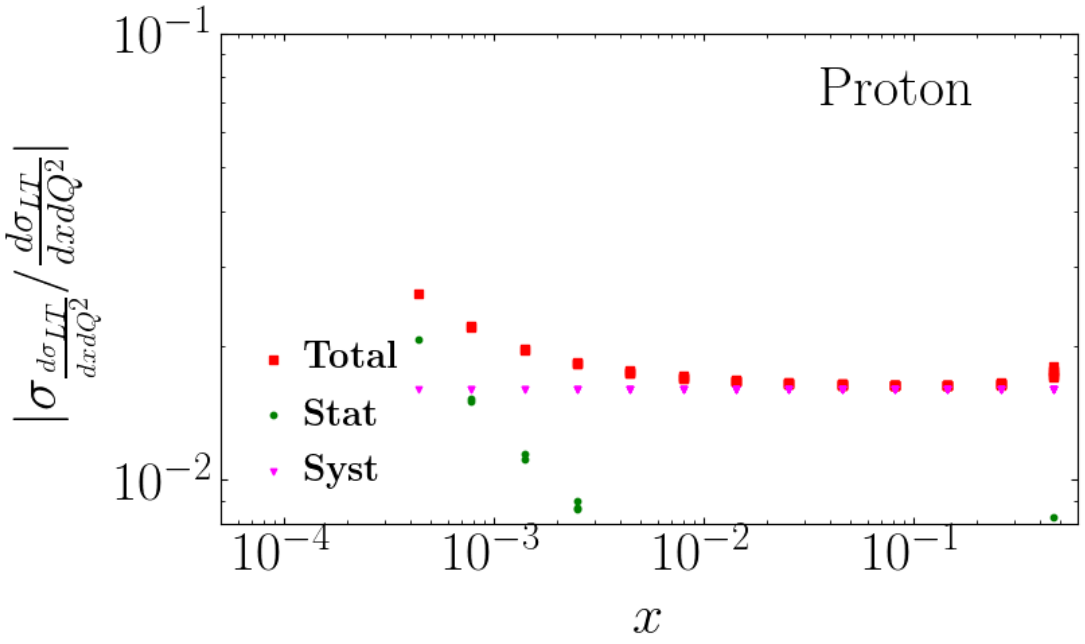
Luminosity: 100 fb^{-1} for all three cases

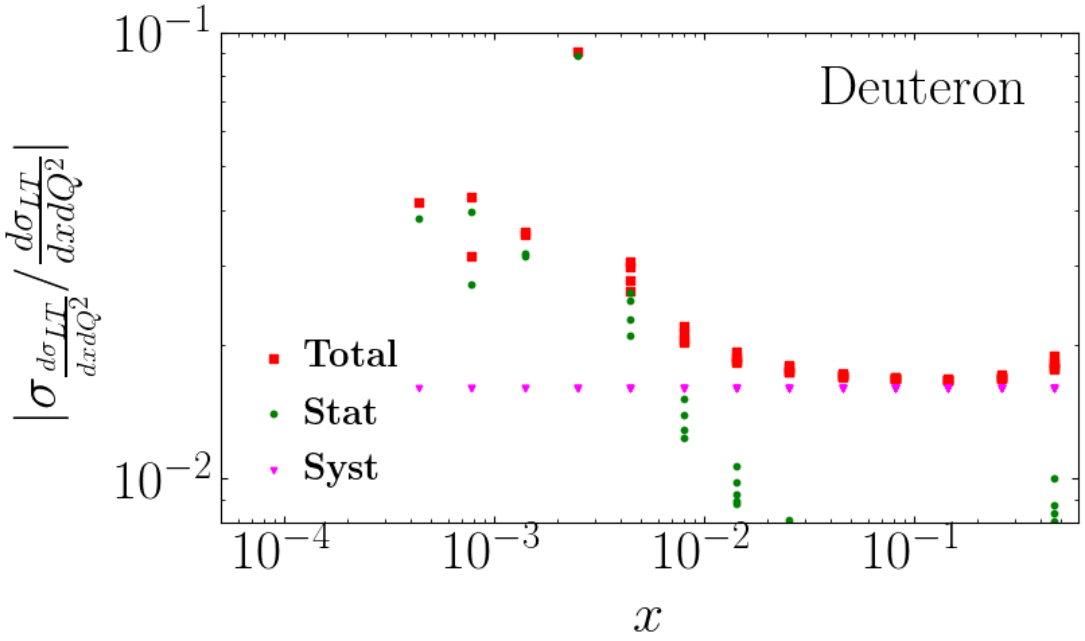
<u>Systematic Errors:</u>

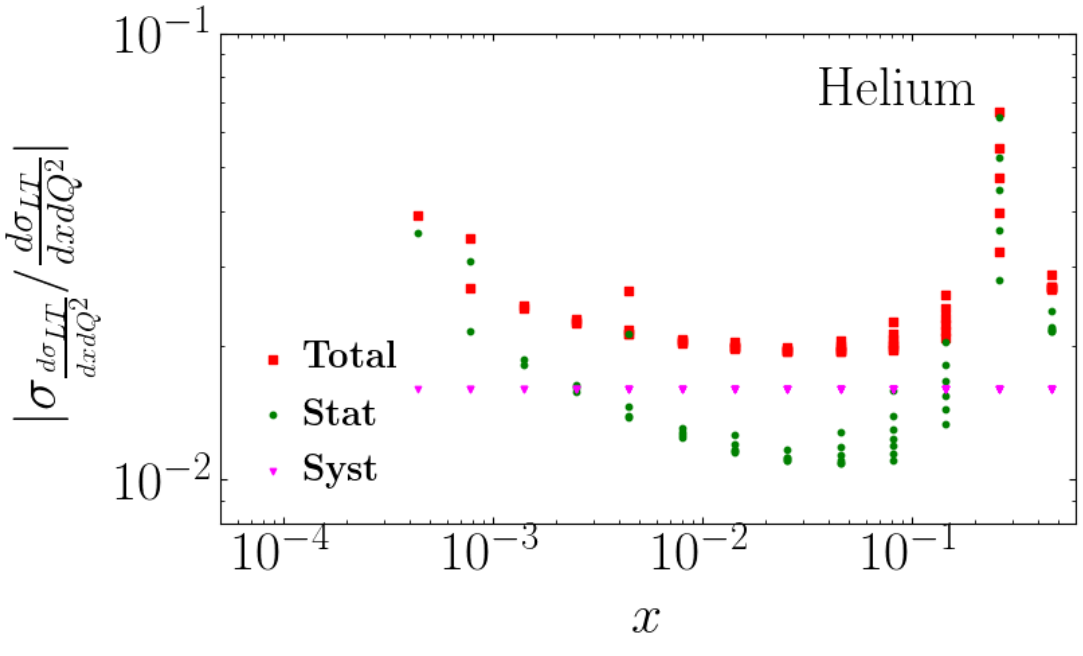
Normalization error: 2.3%

Point-to-Point (uncorrelated) error: 1.6%

Daniel Pitonyak, "Exploring the Structure of Hadrons Through Spin Asymmetries in Hard Scattering Processes"

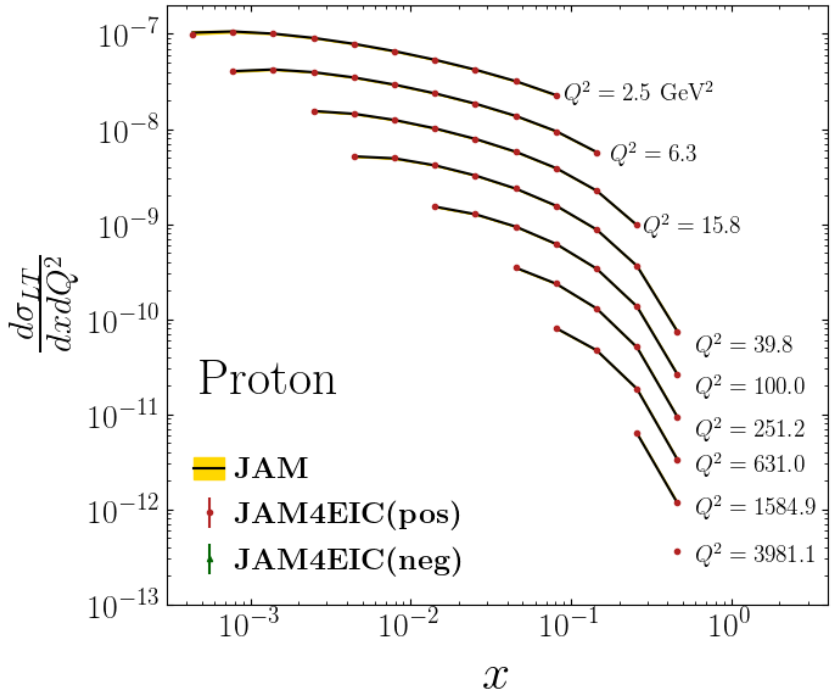


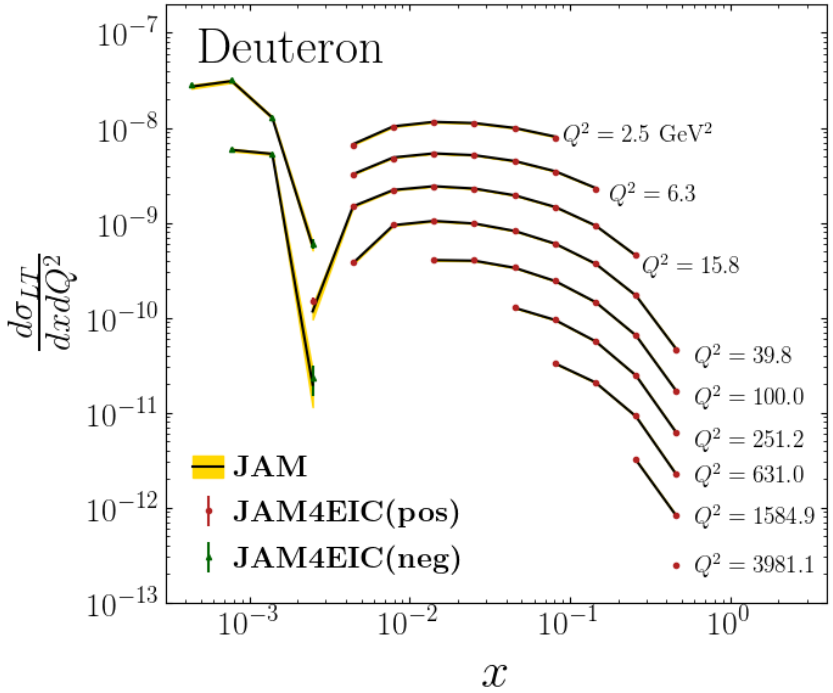


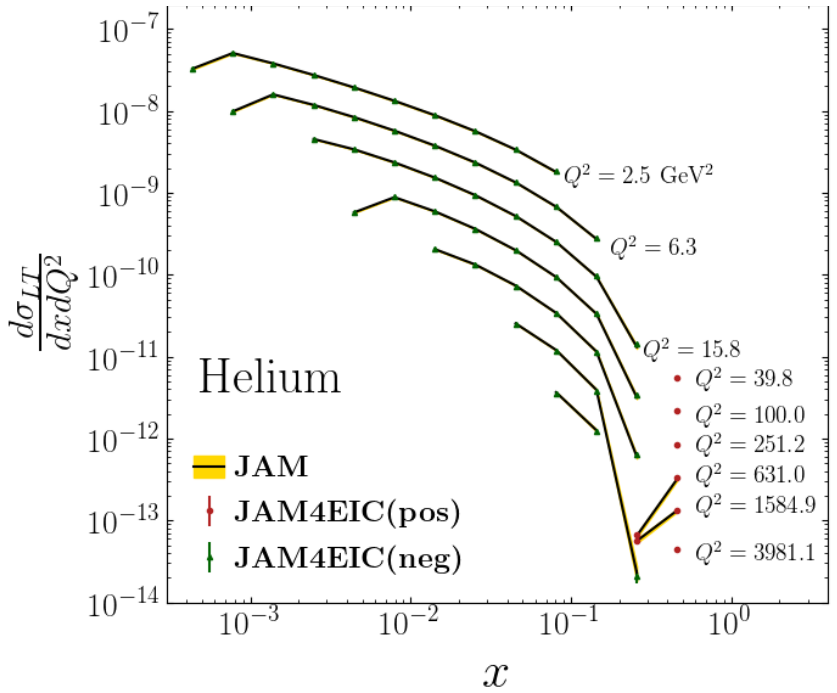


Cross-sections

Note that g_T^p is positive while g_T^n is negative. The asymmetry is therefore always positive for the proton, but negative at a few kinematics for deuterium and at most kinematics for helium.

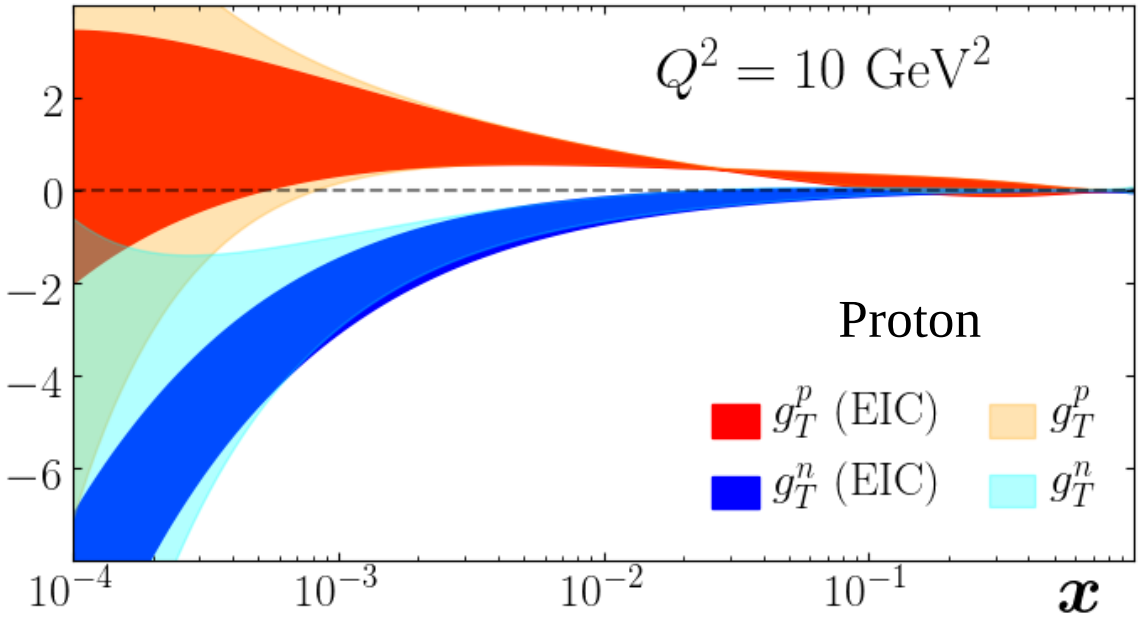


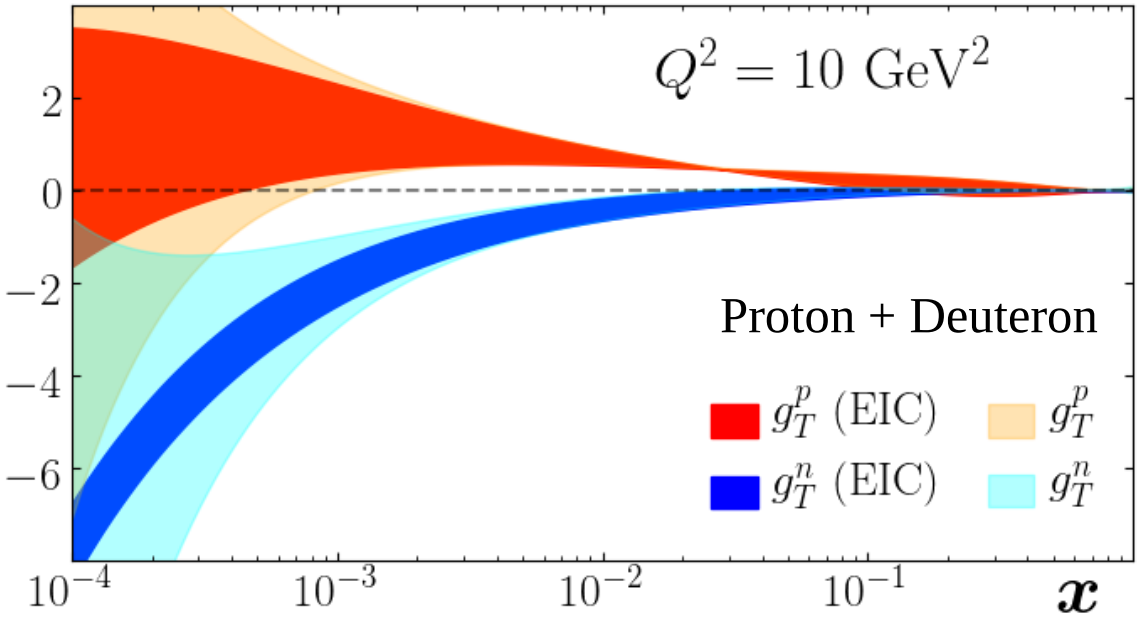


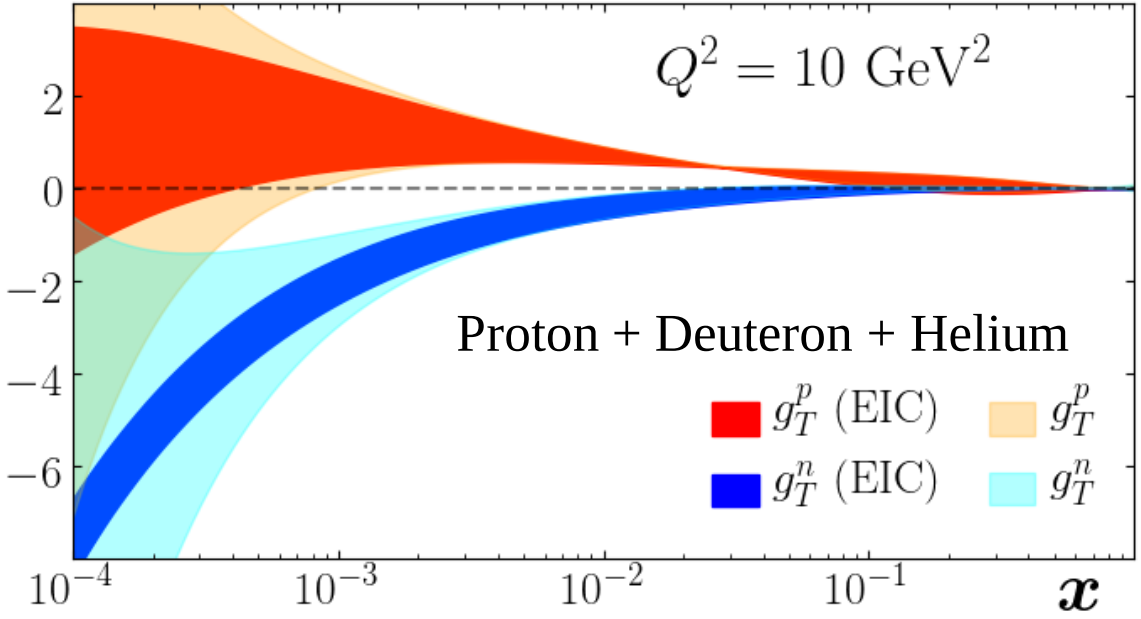


g_T Impact

Proton: Moderate impact at small x for both g_T^p and g_T^n
+Deuteron: Greatly increases impact on g_T^n
+Helium: No further impact







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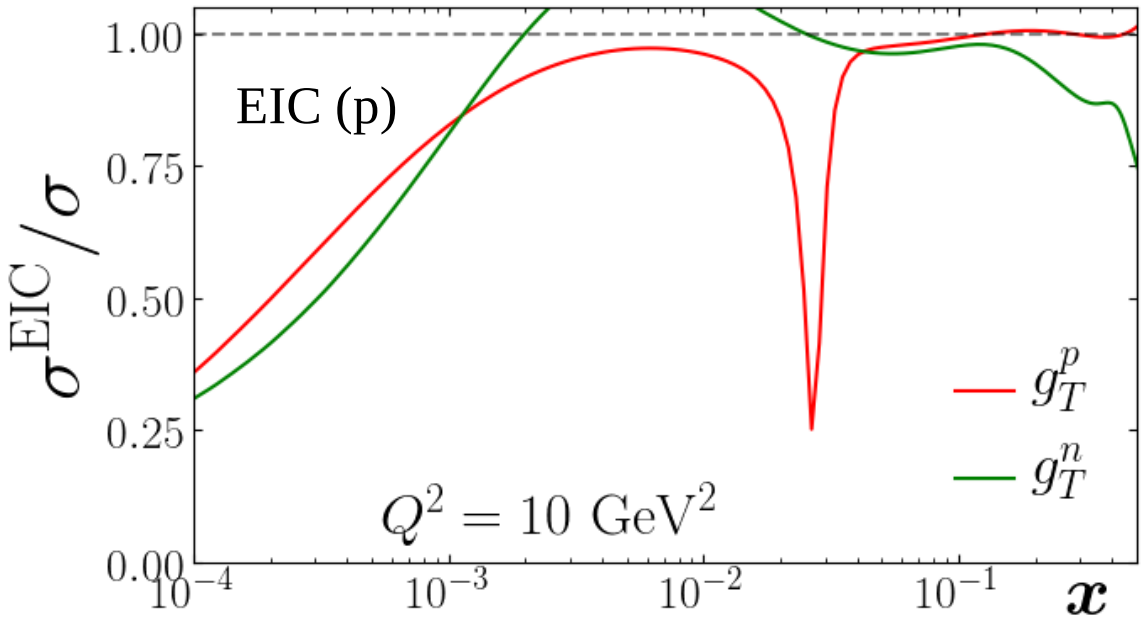

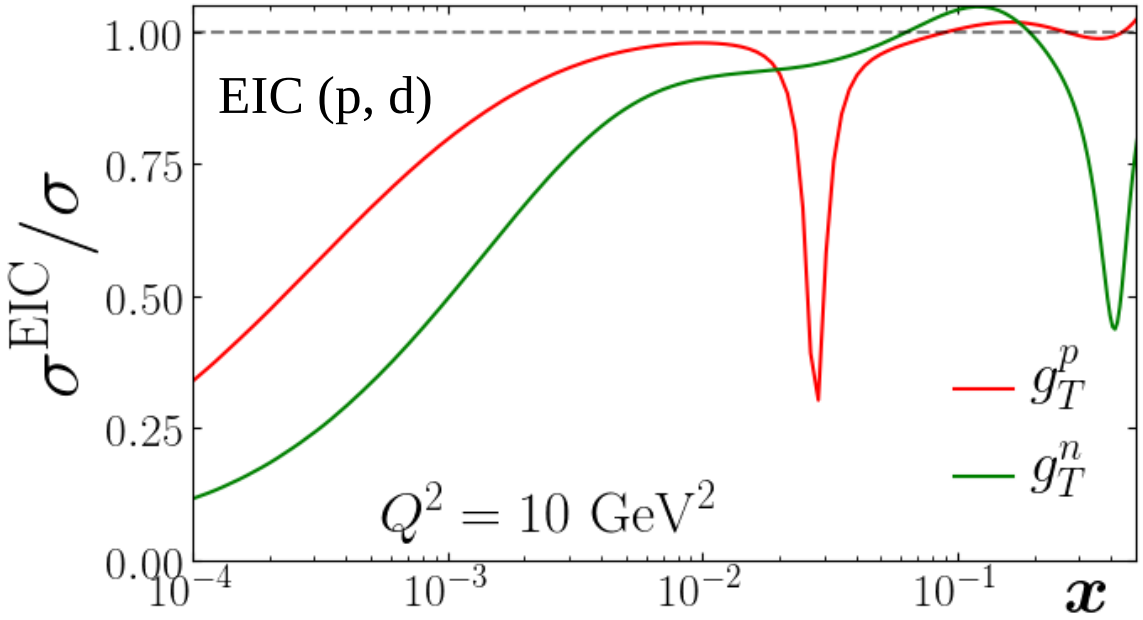

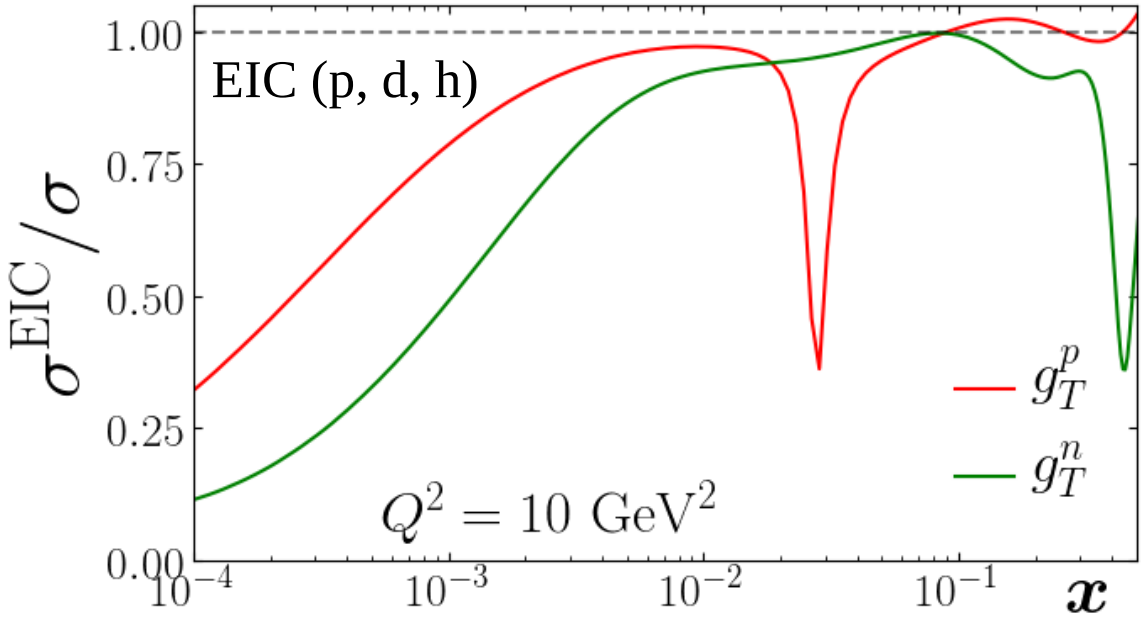

Extra: Summary of Analysis

Included Data:

- Fixed target inclusive polarized DIS with $W^2 > 10\ GeV^2$
- Polarized jet production data from RHIC