A few impressions from Spin 2023 Spencer R. Klein, LBNL

Sept. 24-29, 2023 Durham, NC

Durham NC is a tobacco town





Structure functions

Increasing number of structure functions
Huge amount of large-x data from Jlab

 New deuteron (neutron) DVCS data
 Chiral odd GPDs from ep -> epπ⁰

Transition GPDs that cover reactions like ep->Δ⁺⁺π⁻ e where the incident and outgoing baryons are different



Silvia Niccolai, Orsay

Spin structure functions

- Parton distributions can be negative at low scales
 - Physical observables, like cross-sections must be positive
- Applicable for gluon spin distributions
 - ◆ The sign of ∆g is unknown(?)
- The positivity requirement puts significant constraints on ∆g at large x which can be used to constrain fits to ∆g. These constraints may disfavor solutions with negative ∆g



$$g_{\uparrow/\downarrow} = rac{1}{2}(g\pm\Delta g)$$



Spin 2023 had a significant new-physics component

- The magnetic moment of muons (g-2) is calculable to high order in QED, albeit with significant hadronic contributions
- Experimental measurements over the past ~60 years, culminating in a Fermilab E989
 - 3.094 GeV muon storage ring
- Precise results -> evidence' for BSM physics
 - Recent theory works have found larger uncertainties (with different central values)



Aida X. El-Khadra, U Illinois



LM20

J17

WP20

The fixed target program at the LHC

- Smog2 adds an unpolarized gas target to LHCb
 - Storage cell with H₂, D₂, N₂, O₂, He, Ne, Ar, Kr, Xe
 - Flux known to 1% precision
 - 8,000 J/ψ in 10 minutes of data taking
 - Low pressure higher rates expected
 - $L + C_{spin}$ is a proposed new polarized gas target
 - ♦ L_{pH} = 8*10³²/cm2/s
 - Could go at IR3 (currently unused)
 - Requires a new detector
 - Better forward instrumentation than LHCb?

polarised (+unpolarised)

aas taraet



unpolarised gas target

Pasquale Di Nezza, INFN LNF



