

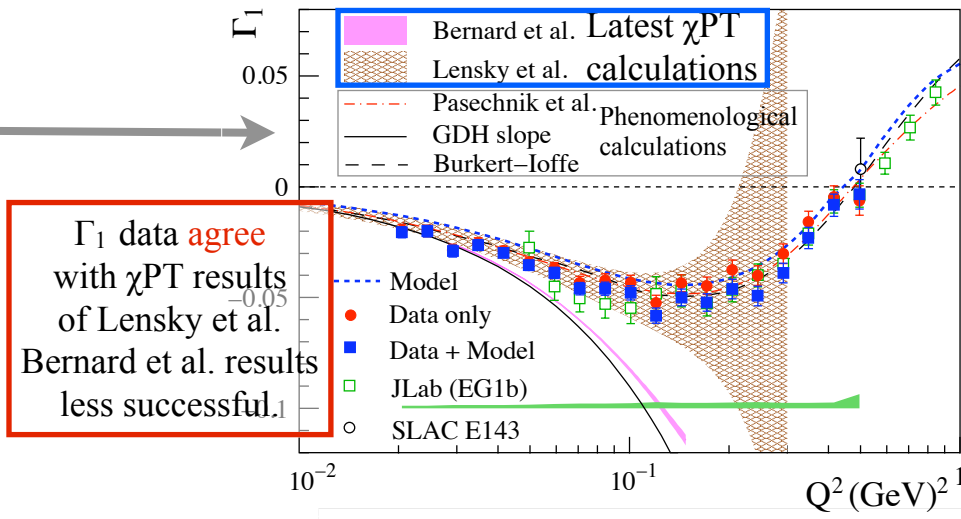
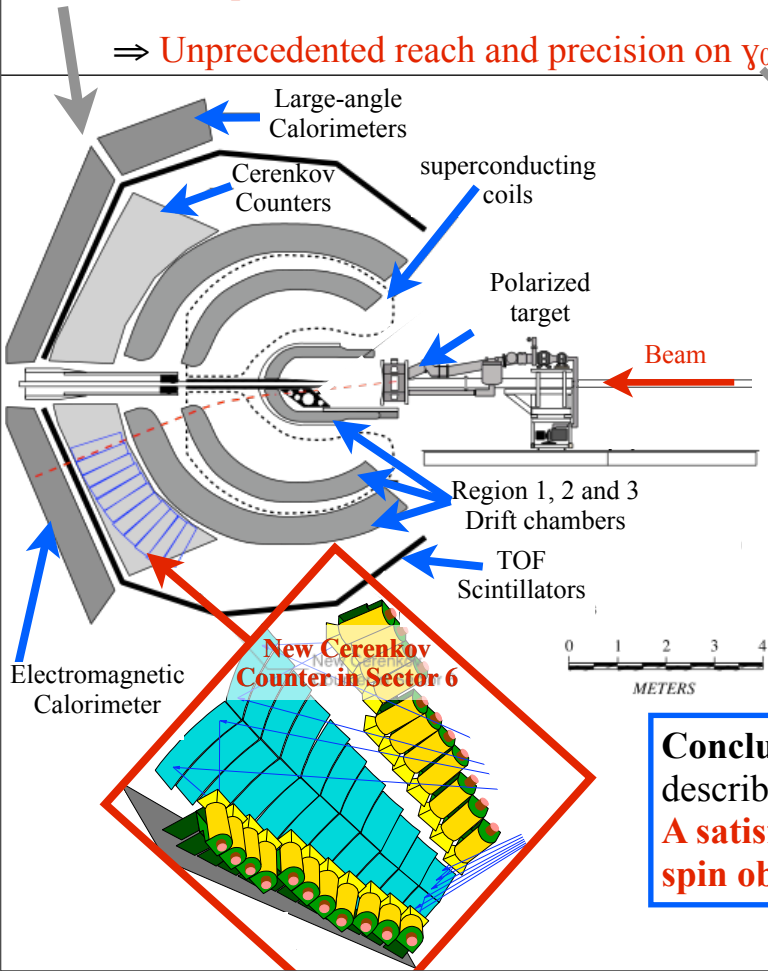
Deuteron Spin Structure at long distance – EG4 in Jefferson Lab’s Hall B

K.P. Adhikari *et al.* (CLAS Collaboration), Phys. Rev. Lett. 120, 062501 (2018)

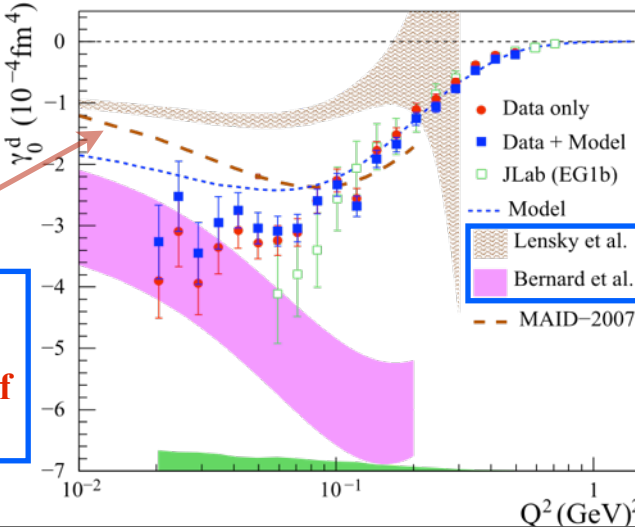
- Test **chiral perturbation theory** (χ PT), the leading approximation of **QCD at very long distance** (i.e. very low Q^2).
- χ PT challenged by earlier JLab data in particular Γ_1 and γ_0 moments of spin structure function. Earlier data focused on QCD’s transition between short and long distances \Rightarrow distances covered not long enough for clean χ PT test. \Rightarrow New JLab program to measure benchmark spin observables for χ PT in Hall B (experiment **EG4**) and Hall A.
- EG4: first **precise measurement of Γ_1 and γ_0 behaviors at large enough distance to unambiguously test χ PT.**

Dedicated setup to reach the smallest Q^2

\Rightarrow Unprecedented reach and precision on γ_0 and Γ_1



γ_0 data **disagree** with Lensky et al. Bernard et al. agrees only for largest distances.



Conclusion: No χ PT single method describes well both Γ_1 and γ_0 .
A satisfactory theoretical description of spin observables remains challenging.