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## Results on spin sum rules and polarizabilities at low $Q^2$ .

We will report on recently published experimental results on spin sum rules, and particularly on the generalized spin polarizabilities  $\gamma_0(Q^2)$  (for both the proton and neutron) and  $\delta_{LT}^n(Q^2)$  (for the neutron).

The data were taken at Jefferson Lab in Hall A (neutron) and B (proton and deuteron) by experiments E97-110 and EG4, respectively. They covered the very low  $Q^2$  domain, down to  $Q^2 \sim 0.02 \text{ GeV}^2$ , where Chiral Effective Field Theory ( $\chi$ EFT) predictions should be valid. While some observables agree with the state-of-the-art  $\chi$ EFT theoretical predictions, others are in tensions, including  $\delta_{LT}^n(Q^2)$  for which  $\chi$ EFT prediction was expected to be robust. This suggests that  $\chi$ EFT does not yet consistently describe nucleon spin observables, even in the very low  $Q^2$  domain covered by the experiments.

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