

## Sivers asymmetry for the proton and the neutron

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A puzzling experimental scenario has arisen recently, after measurements of semi-inclusive deep inelastic scattering (SIDIS) off transversely polarized proton and deuteron targets [1]. A formalism will be described aimed at evaluating the Sivers function entering single spin asymmetries [2]. The approach is well suited for calculations which use constituent quark models to describe the structure of the nucleon. As an example, the Sivers function is evaluated using the Isgur-Karl model. The results are consistent with a sizable Sivers effect, with an opposite sign for the u and d flavors. Although a consistent QCD evolution of the results from the momentum scale of the model to the experimental one is not yet possible, an estimate shows that a reasonable agreement with the available data is obtained once the evolution of the model results is performed.

Besides, with the aim at extracting the neutron information, a measurement of SIDIS off polarized  $^3\text{He}$  has been addressed [3], and two experiments are forth-coming at JLab [4]. An impulse approximation analysis of SIDIS for the production of leading pions off transversely polarized  $^3\text{He}$  will be summarized [5]. The AV18 interaction is used for a realistic description of the nuclear dynamics, and the nucleon structure is described by parameterizations of data or suitable model calculations. The crucial issue of extracting the neutron information from  $^3\text{He}$  data will be discussed. It will be shown that a model independent procedure, based on the realistic evaluation of the proton and neutron polarization in  $^3\text{He}$  [6], widely used in inclusive deep inelastic scattering to take into account effectively the momentum and energy distributions of the bound nucleons in  $^3\text{He}$ , can be applied also in the kinematics of the proposed experiments, although fragmentation functions, not only parton distributions, are involved.

### References

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