

The ^3He spin-dependent structure functions within the Light-front Hamiltonian Dynamics

Wednesday, 11 October 2023 15:40 (20 minutes)

In this talk I will present the results of the calculations of the spin-dependent structure functions (SSFs) of the ^3He nucleus.

These quantities parametrize the hadronic tensor entering the deep inelastic scattering cross-section involving polarized beams and targets. In particular, the SSFs encode relevant information on the spin structure of the target. In this analysis we calculate the ^3He SSFs [1] within the relativistic Light-Front approach successfully tested to evaluate the ^3He EMC effect [2]. In this framework, the calculation fulfills Poincaré covariance, macroscopic locality, number of particles and momentum sum rules.

As nuclear input use has been made of the realistic ^3He wave-functions obtained from the phenomenological $\text{Av18} + \text{UIX}$ potential. Moreover, a procedure to extract the neutron SSFs from those of the ^3He and the proton is also proposed. Finally, I show that the calculations here discussed are in excellent agreement with the present data for the ^3He SSFs.

Hence, this analysis could be very relevant in particular for the future experimental program of, e.g., the Electron ion Collider, where processes off polarized ^3He targets are planned.

REFERENCES

[1] E. Proietti, F. Fornetti, E. Pace, M. Rinaldi, G. Salmè and S. Scopetta, in preparation

[2] E. Pace, M. Rinaldi, G. Salme', S. Scopetta, PLB 839 (2023) 137810

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