TRANSVERSE Λ POLARIZATION IN SEMI-INCLUSIVE DIS

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Transverse hyperon polarization in high-energy, unpolarized hadron collisions is a long-standing challenge for theoretical models of hadronic reactions. Here we recall the main features of our recently proposed approach [1], based on perturbative QCD and its factorization theorems, including polarization and intrinsic transverse momentum, $\boldsymbol{k}_\perp$, effects. It requires the introduction of a new class of leading-twist, polarized and $\boldsymbol{k}_\perp$-dependent fragmentation functions (FF), that have been extracted by fitting available experimental pp data and can be consistently applied to give predictions for other processes.

In order to extend our analysis to the case of Λ polarization in semi-inclusive DIS (SIDIS), $\ell(\nu)p \to \ell' \Lambda^\uparrow X$, the full $\boldsymbol{k}_\perp$ dependence of the polarizing FF is needed. To this end we adopt a simple gaussian model for the unpolarized and polarizing FF, impose the positivity bound for any z and $\boldsymbol{k}_\perp$ and require full consistency with the approximations and parameterizations applied in the fitting procedure to $pp \to \Lambda^\uparrow X$ data (mainly based on average evaluation of $\boldsymbol{k}_\perp$ integrals).

We calculate the expressions for transverse Λ polarization in as many as possible SIDIS processes, i.e. neutral (NC) and charge current (CC) events, and give preliminary predictions for the case of *unpolarized* initial state. We discuss how a combined analysis of these processes can help to extract the full z and $\boldsymbol{k}_\perp$ dependence and the flavour structure of the polarizing FF.

We also show how for a *transversely polarized* target transverse Λ polarization in SIDIS can give information both on the transversity distribution function [2], $\Delta_T q$ [h_1, δq] and, by measuring the $\boldsymbol{k}_\perp$ of the final Λ's, on the polarizing FF.

References

[1] M. Anselmino, D. Boer, U. D'Alesio, F. Murgia, *Phys. Rev.* **D63** (2001) 054029, work in progress.

[2] M. Anselmino, M. Boglione, F. Murgia, *Phys. Lett.* **B481** (2000) 253.