

# Predictions for azimuthal dependence of double spin asymmetries $A_{LT}$ and $A_{LL}$ in Semi Inclusive DIS

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In the leading order of QCD parton model of Semi Inclusive Deep Inelastic Scattering (SIDIS) the double spin asymmetry  $A_{LT}$  arises due to the longitudinal polarization of quarks in the transversely polarized nucleon. The corresponding  $k_T^2$  weighted distribution function  $g_{1T}^{(1)}$  can be related to ordinary helicity distribution  $g_1(x)$  measured in DIS. Using recent parameterizations for (un)polarized distribution and fragmentation functions we calculated  $A_{LT}$  asymmetry on transversely polarized proton and deuteron targets for different types hadron production. The role of Lorentz invariance relations and  $k_T$ -dependent positivity constraints for distribution functions are discussed.

Next, we present the result of our calculations of the transverse momentum dependence of the SIDIS double-spin asymmetry. The  $1/Q$  kinematical corrections induce the azimuthal modulation of this asymmetry. This effect is similar to the Cahn effect in unpolarized SIDIS.

The measurement of azimuthal and transverse momentum dependence of  $A_{LT}$  and  $A_{LL}$  asymmetries will provide the information on the intrinsic momentum dependence of distribution functions  $g_{1L}$  and  $g_{1T}$ .

The predictions are given for COMPASS, HERMES and JLab energies.