

Theoretical description of the spin structure function g_1 at small x and arbitrary Q^2

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Standard Approach (SA) for description of g_1 is based on the DGLAP evolution equations and the special fits for the initial parton densities. SA accounts for the total resummation of logs of Q^2 and lacks the total resummation of leading $\ln(1/x)$. In order to meet the small $-x$ experimental data, SA includes phenomenological singular factors in the fits. They mimic the resummation of $\ln(1/x)$ and lead to the steep rise of g_1 at small x . When the resummation is accounted for, the fits can be drastically simplified.

The further advantage of our approach lays in analysis of DIS at small Q^2 . Indeed, DGLAP cannot be applied to the region of small Q^2 presently studied by COMPASS collaboration. Contrary to it, our approach works in this kinematics and predicts a very weak x -dependence of g_1 at small Q^2 even at very small values of x . Instead, experimental investigation of the g_1 dependence on the invariant energy $2pq$ would be extremely interesting because it allows one to estimate the impact of the gluon initial density.

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