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Helicity Evolution at Small x: the Single-Logarithmic Contribution

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We calculate single-logarithmic corrections to the small-x flavor-singlet helicity evolution equations derived recently in the double-logarithmic approximation. The new single-logarithmic part of the evolution kernel sums up powers of $\alpha_s \ln(1/x)$, which are an important correction to the dominant powers of $\alpha_s \ln^2(1/x)$ summed up previously by the double-logarithmic kernel at small values of Bjorken x and with α_s the strong coupling constant. The single-logarithmic terms arise separately from either the longitudinal or transverse momentum integrals. Consequently, the evolution equations we derive simultaneously include the small-x evolution kernel and the leading-order polarized DGLAP splitting functions. We further enhance the equations by calculating the running coupling corrections to the kernel.

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