

# Helicity Evolution at Small-x

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We construct small-x evolution equations which can be used to calculate quark and anti-quark helicity TMDs and PDFs, along with the  $g_1$  structure function. These evolution equations resum powers of  $\alpha_s \ln^2(1/x)$  in the polarization-dependent evolution: hence our equations collect powers of the parameter excluded in the DGLAP and CSS evolutions. The full non-linear version of our equations also resums the powers of  $\alpha_s \ln(1/x)$  in the unpolarized evolution which includes saturation effects. The equations are written in an operator form in terms of polarization-dependent Wilson line-like operators. While the equations do not close in general, they become closed and self-contained systems of non-linear equations in the large- $N_c$  and large- $N_c$  and  $N_f$  limits. The resulting x-dependence of quark helicity TMD and PDF can be obtained by solving these equations numerically.

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