## XXVIII International Workshop on Deep Inelastic Scattering and Related Subjects



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## Helicity at Small x: Bringing Back the Quarks

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We find the small-x asymptotics of the quark helicity distribution in the large- $N_c \& N_f$  limit by numerically solving small-x evolution equations derived in earlier works, where  $N_c$  is the number of quark colors and  $N_f$ is the number of quark flavors. Previously, those evolution equations were solved only in the large- $N_c$  limit. We find that  $\Delta q$  oscillates as a function of  $\ln(1/x)$  at small x, with the oscillation frequency being dependent on the number of quark flavors,  $N_f$ . Our result may account for the apparent oscillation in the strange quark helicity distribution  $\Delta s$  as a function of Bjorken x. For  $N_f = 0$ , these oscillations disappear; this is why they were not seen in the earlier large- $N_c$  studies. Our work presents the most precise theoretical determination of the small-x asymptotics of the quark helicity distribution based on the Wilson line approach to small-x evolution. When combined with the future EIC data, our approach should allow for a precise determination of the amount of the proton spin coming from small-x partons, thus contributing to the resolution of the proton spin puzzle.

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