Abstract Submitted
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Helicity at Small x: Bringing Back the Quarks[1] YOSSATHORN
TAWABUTR, YURI KOVCHEGOV, Ohio State Univ - Columbus — 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 Δq
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 Δs 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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