

Abstract Submitted  
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**Small- $x$  Asymptotics of the Gluon Helicity Distribution**<sup>1</sup> YURI KOVCHEGOV, Ohio State Univ - Columbus, DANIEL PITONYAK, Penn State University-Berks, MATTHEW SIEVERT, Los Alamos National Laboratory — We determine the small- $x$  asymptotics of the gluon helicity distribution in a proton at leading order in perturbative QCD at large  $N_c$ . To achieve this, we begin by evaluating the dipole gluon helicity TMD at small  $x$ . We then construct and solve novel small- $x$  large- $N_c$  evolution equations for the operator related to the dipole gluon helicity TMD. Our main result is the small- $x$  asymptotics for the gluon helicity distribution:  $\Delta G \sim (1x)^{\alpha_h^G}$  with  $\alpha_h^G = 134\sqrt{3} \sqrt{N_c 2\pi} \approx 1.88 \sqrt{N_c 2\pi}$ . We note that the power  $\alpha_h^G$  is approximately 20% lower than the corresponding power  $\alpha_h^q$  for the small- $x$  asymptotics of the quark helicity distribution defined by  $\Delta q \sim (1x)^{\alpha_h^q}$  with  $\alpha_h^q = 4\sqrt{3} \sqrt{N_c 2\pi} \approx 2.31 \sqrt{N_c 2\pi}$  found in our earlier work.

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