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Erratum: Helicity evolution at small x

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Figure 1. Large- N_c helicity evolution for the polarized dipole amplitude G and the neighbor dipole amplitude Γ . As before, for pictorial simplicity we do not show the contributions of the initial condition terms. Double lines denote gluons at large N_c . Only one of the virtual diagrams is shown (last diagram in each line): virtual corrections to the right of the shock wave are implied, but not shown explicitly.

- On the right-hand side of eq. (5.13) one should have $U_{\underline{2}}^{pol \dagger ab}$ and $U_{\underline{1}}^{unp \dagger ab}$ instead of $U_{\underline{2}}^{pol \dagger ba}$ and $U_{\underline{1}}^{unp \dagger ba}$ respectively.
- On the right-hand side of eq. (5.17) one should have dz'/z' instead of dz'/z .
- On the right-hand side of eq. (5.18b) one should replace $V_{\underline{1}}^{unp \dagger}$ by $V_{\underline{2}}^{pol}$. One should also add $\frac{1}{N_c^2-1} \left\langle \text{tr} \left[U_{\underline{1}}^{pol \dagger} \right] \right\rangle_0(z)$ to the right-hand side of eq. (5.18b).
- Eq. (5.35) should read

$$G_{10}(z) = G_{10}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) [2 \Gamma_{02,21}(z') S_{21}(z') + 2 G_{21}(z') S_{02}(z') + G_{12}(z') S_{02}(z') - \Gamma_{01,21}(z')] \quad (5.35)$$

- Eq. (5.37) should read

$$\Gamma_{02,21}(z') = \Gamma_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} [2 \Gamma_{03,32}(z'') S_{23}(z'') + 2 G_{32}(z'') S_{03}(z'') + G_{23}(z'') S_{03}(z'') - \Gamma_{02,32}(z'')] \quad (5.37)$$

with the last terms on the right of figure 13 relabeled yielding figure 1 here.

- The following clarifying paragraph should be added after figure 13: “We had to double the coefficients of the first two terms on the right-hand side of eq. (5.35) to account for the fact that, in the large- N_c limit, the factor associated with the polarized gluon emission by the gluon is four times larger than the factor associated with the polarized gluon emission by a quark (see e.g. the right column of eq. (5.21)): only half of that difference is due to the color factors.”

Figure 2. Large- N_c & N_f helicity evolution for the polarized dipole amplitudes Q , G and A .

- The following sentence should be added to the paragraph containing figure 14: “Note that the virtual (last) term in eq. (5.35) can be shown to bring in a neighbor dipole amplitude $\Gamma_{01,21}(z')$.”
- Eqs. (5.38) should read

$$G_{01}(z) = G_{01}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2}^{x_{10}^2} \frac{dx_{21}^2}{x_{21}^2} [\Gamma_{02,21}(z') + 3 G_{21}(z')], \quad (5.38a)$$

$$\Gamma_{02,21}(z') = \Gamma_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} [\Gamma_{03,32}(z'') + 3 G_{23}(z'')]. \quad (5.38b)$$

- Eq. (5.42) should read

$$\begin{aligned} Q_{10}(z) = & Q_{10}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) \\ & \times [S_{21}(z') \Gamma_{02,21}(z') + S_{02}(z') G_{21}(z') + S_{02}(z') A_{12}(z') - \bar{\Gamma}_{01,21}(z')] \\ & + \frac{\alpha_s N_c}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') S_{01}(z') A_{21}(z'). \end{aligned} \quad (5.42)$$

- Eq. (5.43) should read

$$\begin{aligned} G_{10}(z) = & G_{10}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) \\ & \times [2 S_{21}(z') \Gamma_{02,21}(z') + 2 S_{02}(z') G_{21}(z') + S_{02}(z') G_{12}(z') - \Gamma_{01,21}(z')] \\ & - \frac{\alpha_s N_f}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') \bar{\Gamma}_{02,21}(z'). \end{aligned} \quad (5.43)$$

- Eq. (5.44) should read

$$\begin{aligned}
 A_{10}(z) = & A_{10}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) \\
 & \times [S_{21}(z') \Gamma_{02,21}(z') + S_{02}(z') G_{21}(z') + S_{02}(z') A_{12}(z') - \bar{\Gamma}_{01,21}(z')] \\
 & + \frac{\alpha_s N_c}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') S_{01}(z') A_{21}(z'). \quad (5.44)
 \end{aligned}$$

with some terms on the right of figure 16 relabeled to give figure 2 here.

- Eq. (5.45) should read

$$\begin{aligned}
 \Gamma_{02,21}(z') = & \Gamma_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} \\
 & \times [2\Gamma_{03,32}(z'') S_{23}(z'') + 2G_{32}(z'') S_{03}(z'') + G_{23}(z'') S_{03}(z'') - \Gamma_{02,32}(z'')] \\
 & - \frac{\alpha_s N_f}{4\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{x_{21}^2 z'/z''} \frac{dx_{32}^2}{x_{32}^2} \bar{\Gamma}_{03,32}(z'). \quad (5.45)
 \end{aligned}$$

- Eq. (5.46) should read

$$\begin{aligned}
 \bar{\Gamma}_{02,21}(z') = & \bar{\Gamma}_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} \\
 & \times [\Gamma_{03,32}(z'') S_{23}(z'') + G_{32}(z'') S_{03}(z'') + A_{23}(z'') S_{03}(z'') - \bar{\Gamma}_{02,32}(z'')] \\
 & + \frac{\alpha_s N_c}{4\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho''^2}^{x_{21}^2 z'/z''} \frac{dx_{32}^2}{x_{32}^2} S_{02}(z') A_{32}(z'). \quad (5.46)
 \end{aligned}$$

with some terms on the right of figure 18 relabeled to give figure 3 here.

- Eqs. (5.47) should read

$$\begin{aligned}
 Q_{01}(z) = & Q_{01}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) [G_{12}(z') + \Gamma_{02,21}(z') + A_{21}(z') - \bar{\Gamma}_{01,21}(z')] \\
 & + \frac{\alpha_s N_c}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int_{\rho'^2} \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') A_{21}(z'), \quad (5.47a)
 \end{aligned}$$

Figure 3. Large- N_c & N_f helicity evolution for the polarized neighbor dipole amplitudes Γ and $\bar{\Gamma}$.

$$\begin{aligned}
 G_{10}(z) = & G_{10}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) [\Gamma_{02,21}(z') + 3 G_{12}(z')] \\
 & - \frac{\alpha_s N_f}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') \bar{\Gamma}_{02,21}(z'),
 \end{aligned} \tag{5.47b}$$

$$\begin{aligned}
 A_{01}(z) = & A_{01}^{(0)}(z) + \frac{\alpha_s N_c}{2\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int \frac{d^2 x_2}{x_{21}^2} \theta(x_{10} - x_{21}) [G_{12}(z') + \Gamma_{02,21}(z') + A_{21}(z') - \bar{\Gamma}_{01,21}(z')] \\
 & + \frac{\alpha_s N_c}{4\pi^2} \int_{z_i}^z \frac{dz'}{z'} \int \frac{d^2 x_2}{x_{21}^2} \theta(x_{10}^2 z - x_{21}^2 z') A_{12}(z').
 \end{aligned} \tag{5.47c}$$

- Eqs. (5.48) should read

$$\begin{aligned}
 \Gamma_{02,21}(z') = & \Gamma_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho'^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} [\Gamma_{03,32}(z'') + 3 G_{23}(z'')] \\
 & - \frac{\alpha_s N_f}{4\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho'^2}^{x_{21}^2 z'/z''} \frac{dx_{32}^2}{x_{32}^2} \bar{\Gamma}_{03,32}(z''),
 \end{aligned} \tag{5.48a}$$

$$\begin{aligned}
 \bar{\Gamma}_{02,21}(z') = & \bar{\Gamma}_{02,21}^{(0)}(z') + \frac{\alpha_s N_c}{2\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \\
 & \times \int_{\rho'^2}^{\min\{x_{02}^2, x_{21}^2 z'/z''\}} \frac{dx_{32}^2}{x_{32}^2} [\Gamma_{03,32}(z'') + G_{23}(z'') + A_{23}(z'') - \bar{\Gamma}_{02,32}(z'')] \\
 & + \frac{\alpha_s N_c}{4\pi} \int_{z_i}^{z'} \frac{dz''}{z''} \int_{\rho'^2}^{x_{21}^2 z'/z''} \frac{dx_{32}^2}{x_{32}^2} A_{32}(z').
 \end{aligned} \tag{5.48b}$$

- The right-hand side of eq. (A.12) should be multiplied by 2.

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