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Erratum: The LPM effect in sequential bremsstrahlung

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The denominator $X_{\rm y}(X_{\rm y}X_{\bar{\rm y}} - X_{\rm y\bar{y}}^2)$ on the far right-hand side of (5.44d) should be $X_{\bar{\rm y}}(X_{\rm y}X_{\bar{\rm y}} - X_{\rm y\bar{y}}^2)$. Analogously, the denominator $X_{\bar{\rm y}}(X_{\rm y}X_{\bar{\rm y}} - X_{\rm y\bar{y}}^2)$ on the far right-hand side of (5.44e) should be $X_{\rm y}(X_{\rm y}X_{\bar{\rm y}} - X_{\rm y\bar{y}}^2)$. These errors propagate to the following corrections to the rest of the paper and significantly change the infrared behavior of the result.

The behavior $\alpha_{\rm s}^2/x^3y^{3/2}$ shown on the right-hand side of (1.7) and (9.11) should instead be $\alpha_{\rm s}^2\ln(y)/xy^{3/2}$. But both here and in (1.6), it would be more precise and informative to write $\ln(y/x)$ instead of $\ln(y)$.

The $x_{\rm min}^{-5/2}$ in the text following (9.11) then becomes $x_{\rm min}^{-1/2}\ln^2 x_{\rm min}$, and so this divergence is almost as mild as the single-splitting divergence mentioned in the next sentence of the text.

There is another error in the paper concerning the calculation of the pole terms in section 7. Section 7 successfully calculates a subset of the pole contributions associated with $\Delta t = 0$ but misses others. This error requires a lengthy analysis to explain and correct, which may be found in ref. [41] below.

The effects of the above correction to (5.44) and the correction [41] to the pole terms are that the number 10.437054610798 in footnote 35 should be -10.892657927744, the corresponding statement in the main text that $[d\Gamma/dx\,dy]_{\rm crossed}$ is positive for $(x,y) = (0.3, 0.6)$ is no longer true, and figure 27 and its caption should be replaced by those below.

There are some purely typographic errors. In eqs. (5.7), (5.8) and (5.9a), all occurrences of $\boldsymbol{B}_1$ in those equations should be replaced by $\boldsymbol{B}'$. Eq. (6.10) should include a factor of E on the right-hand side. The $\Omega_\pm$ appearing on the right-hand side of (E.9) should be Ω_-.

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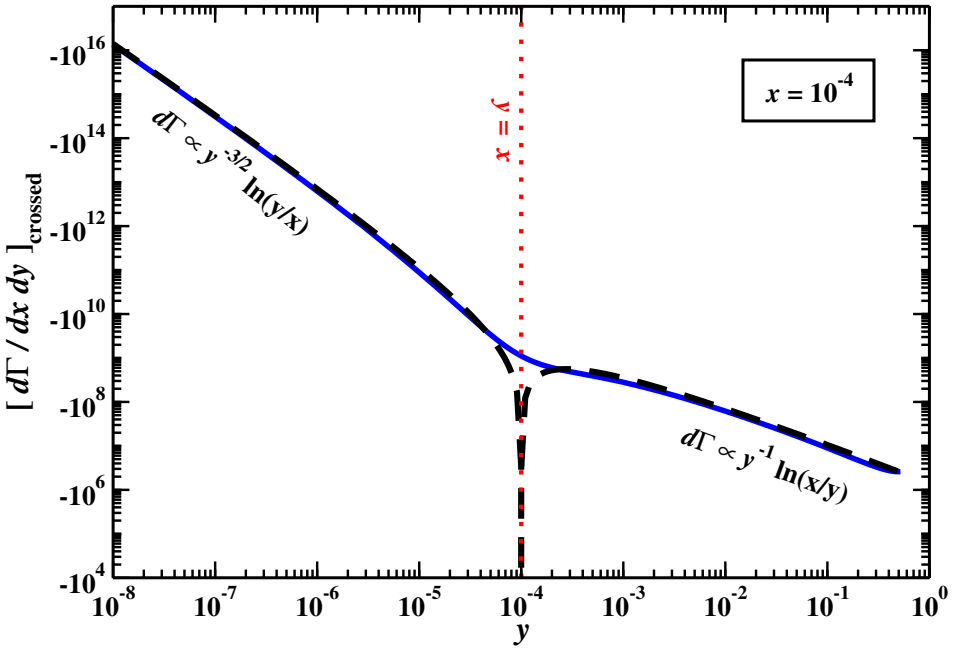

Figure 27. Our numerical results (solid line) for the total crossed diagram contribution to $d\Gamma/dx\,dy$ [in units of $C_{\rm A}^2\alpha_{\rm s}^2\sqrt{\hat{q}_{\rm A}/E}$] vs. y for fixed $x = 10^{-4}$. The $d\Gamma \propto y^{-3/2}\ln(y/x)$ dashed line shows the $y^{-3/2}\ln(y/x)$ behavior of the $y \ll x \ll 1$ power law quoted in (9.11). The $d\Gamma \propto y^{-1}\ln(x/y)$ dashed line shows the $x^{-1}\ln(y/x)$ behavior of the same power law if one switches the labels x and y. We have only shown results for $y \leq 0.5$; results for $y > 0.5$ are given by the permutation symmetry $y \leftrightarrow z \equiv 1-x-y$ of the problem.

Finally, an embarrassingly misleading choice of notation was made in section 2.2, starting in (2.16). The $d^2\Gamma_{\rm el}/d^2\boldsymbol{b}_\perp$ defined in (2.17) is *not* a "differential rate with respect to impact parameter" and should not have been called that, and the notation $d^2\Gamma_{\rm el}/d^2\boldsymbol{b}_\perp$ should not have been used. A better notation is to replace $d^2\Gamma_{\rm el}/d^2\boldsymbol{b}_\perp$ and $d^2\bar{\Gamma}_{\rm el}/d^2\boldsymbol{b}_\perp$ by simply $\Gamma_{\rm el}$ and $\bar{\Gamma}_{\rm el}$ throughout this section. In the new notation, $\Gamma_{\rm el}(0,t)$ is the rate of elastic scattering from the medium, and $\Gamma_{\rm el}(\boldsymbol{b},t)$ is the Fourier transform of the differential rate $d^2\Gamma_{\rm el}/d^2\boldsymbol{q}_\perp$ with respect to transverse momentum transfer $\boldsymbol{q}_\perp$.

[41] P. Arnold, H.C. Chang and S. Iqbal, *The LPM effect in sequential bremsstrahlung: dimensional regularization*, arXiv:1606.08853 [INSPIRE].

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