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Erratum

Erratum to: Transverse polarization of top quarks produced in e^+e^--annihilation at $O(\alpha_s)$

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We discovered a sign mistake in the normal polarization contribution $H_I^{1,2\,N'}(\alpha_s)$ given in equation (32) of the above paper. The corrected contribution reads

$$\hat{H}_I^{1,2\,N'}(\alpha_s) = \frac{\alpha_s}{\pi} N_C C_F \frac{m\sqrt{q^2}}{2\sqrt{2}} \pi v. \tag{32}$$

We are now in agreement with the results of Ref. [1]. This correction leads to substantial changes in our Figs. 2b and 3b, which display the $\cos\theta$ dependence of the normal polarization for top and bottom quarks. The corrected figures are shown below.

In addition, (34) and (35) should be replaced by

$$\frac{d\sigma^{\perp'}}{d\cos\theta} = -\frac{\pi\alpha^2 v}{2\sqrt{2}q^4}\{\sin 2\theta(g_{13}\hat{H}_I^{3\perp'} + g_{14}\hat{H}_I^{4\perp'}) + 2\sin\theta(g_{41}\hat{H}_A^{1\perp'} + g_{42}\hat{H}_A^{2\perp'})\}, \tag{34}$$

$$\frac{d\sigma^{N'}}{d\cos\theta} = -\frac{\pi\alpha^2 v}{2\sqrt{2}q^4}\{\sin 2\theta(g_{11}\hat{H}_1^{1N'} + g_{12}H_I^{2N'}) + 2\sin\theta(g_{43}\hat{H}_A^{3N'} + g_{44}\hat{H}_A^{4N'})\} \tag{35}$$

in order to be applicable also to the $O(\alpha_s)$ real part and Born term contributions.

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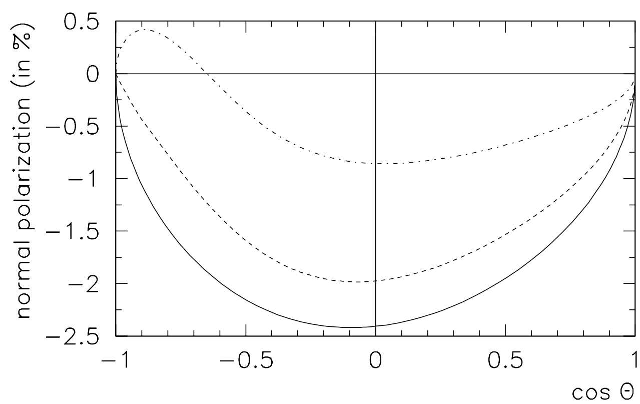

Fig. 2b Transverse normal polarization for the top quark with mass $m_t = 174$ GeV and running constant α_s, $\alpha_s(M_Z) = 0.118$ at three different energies ($\sqrt{q^2} = 360$ GeV (*full line*), 500 GeV (*dashed*) and 1000 GeV (*dash-dotted*))

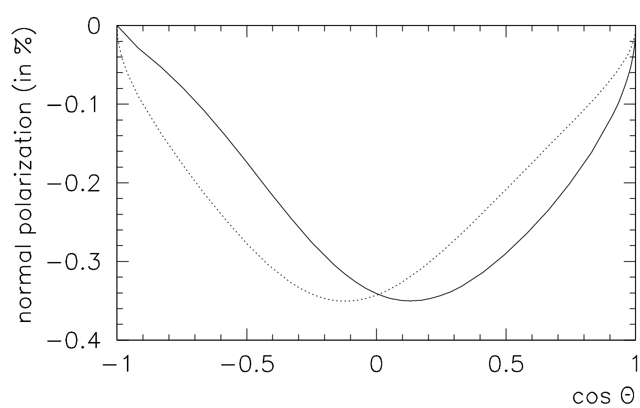

Fig. 3b Transverse normal polarization for the bottom quark on the Z-peak (with bottom mass set to $m_b = 4.83$ GeV and $\alpha_s(M_Z) = 0.118$). *Full line*: $O(\alpha_s^0) + O(\alpha_s)$; *dotted line*: Born term result

References

1. V. Ravindran, W.L. van Neerven, Nucl. Phys. B **589**, 507 (2000)