1 Leading order cross section and comparison with literature

Results for $t\bar{t}\gamma$-production derived with following numerical parameters

$$m_t = 171.2\ \text{GeV}, \quad \mu_F = m_t, \quad \alpha = \frac{1}{127.918}, \quad \alpha_S = 0.118, \quad p_{\text{T}}^{\gamma} > 20\ \text{GeV}$$

and CTEQ6L1 confirming the results by Ma Wen-Gan et al. at the LHC

$$\sigma_{\text{tot}}^{\text{LHC}} = \sigma_{\text{tot}}^{\text{gg}\to\text{t}\bar{\text{t}}\gamma} + \sigma_{\text{tot}}^{\text{q}\bar{\text{q}}\to\text{t}\bar{\text{t}}\gamma} = 1.417\ \text{pb} + 0.722\ \text{pb} = 2.139\ \text{pb} \tag{1}$$

and at the Tevatron

$$\sigma_{\text{tot}}^{\text{TEV}} = \sigma_{\text{tot}}^{\text{gg}\to\text{t}\bar{\text{t}}\gamma} + \sigma_{\text{tot}}^{\text{q}\bar{\text{q}}\to\text{t}\bar{\text{t}}\gamma} = 0.28\ \text{fb} + 43.45\ \text{fb} = 43.73\ \text{fb}. \tag{2}$$

For $p_{\text{T}}^{\gamma} > 30, 40$ GeV I get

$$\begin{aligned} \sigma_{\text{tot}}^{\text{TEV}}(p_{\text{T}}^{\gamma} > 30\ \text{GeV}) &= 27.85\ \text{fb}, \\ \sigma_{\text{tot}}^{\text{TEV}}(p_{\text{T}}^{\gamma} > 40\ \text{GeV}) &= 19.07\ \text{fb}. \end{aligned} \tag{3}$$

The corresponding leading order p_{T}-distributions and the comparsion with the literature is shown on the following pages.

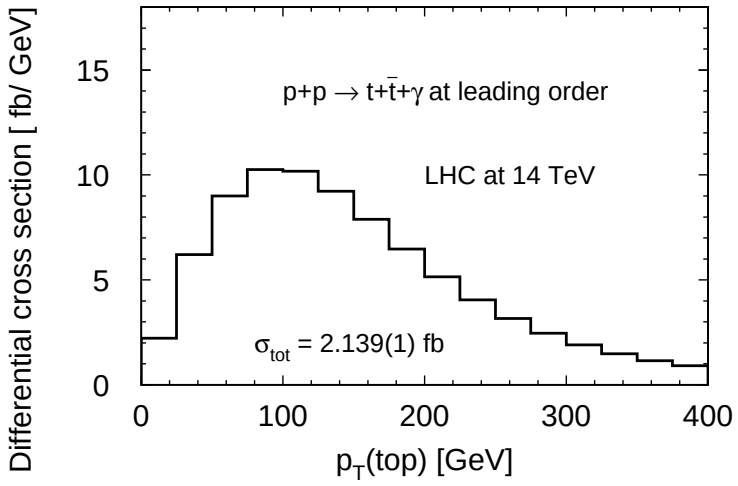

Figure 1: Differential cross section as function of the transverse momentum of the top-quark.

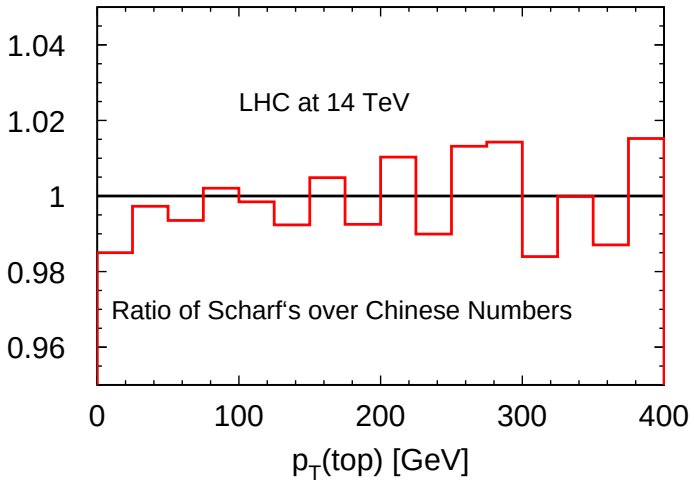

Figure 2: Comparison of transverse momentum distribution at the LHC. Shown is the ratio of my numbers over the numbers from literature.

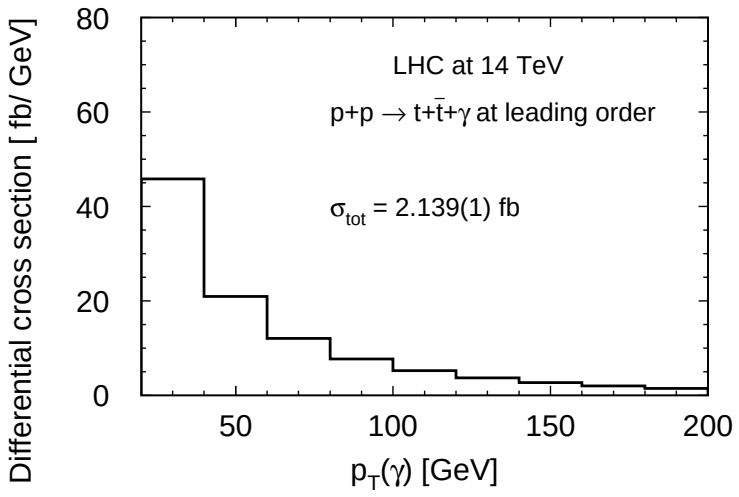

Figure 3: Differential cross section as function of the transverse momentum of the photon.

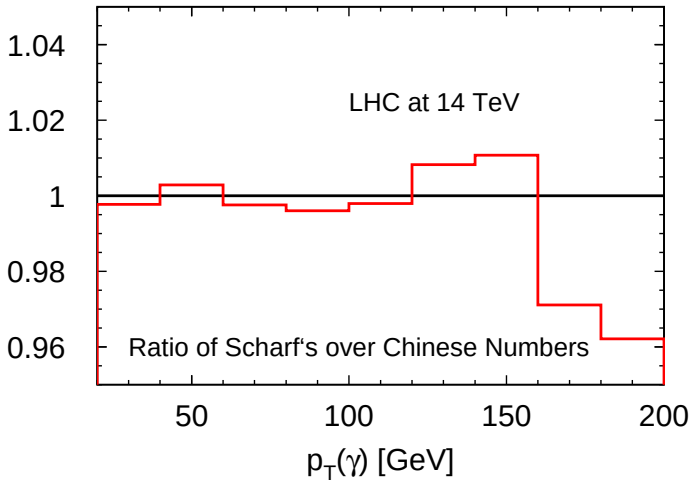

Figure 4: Comparison of transverse momentum distribution at the LHC. Shown is the ratio of my numbers over the numbers from literature.

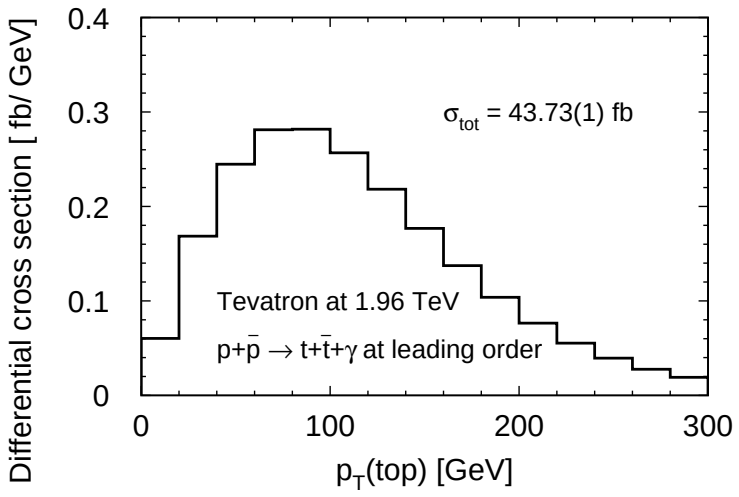

Figure 5: Differential cross section as function of the transverse momentum of the top-quark.

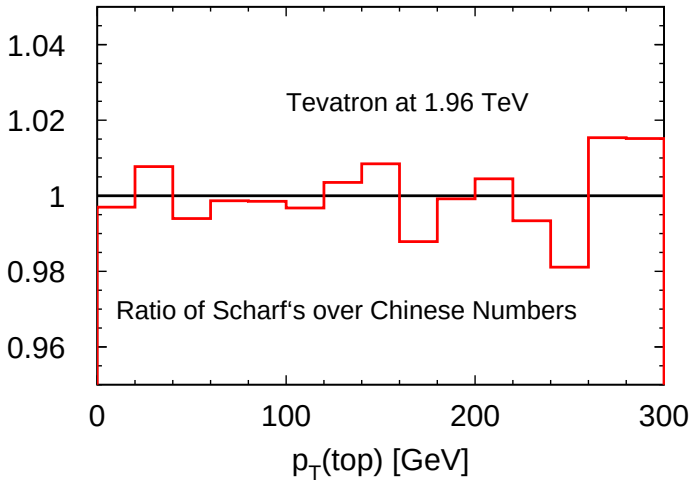

Figure 6: Comparison of transverse momentum distribution at the Tevatron. Shown is the ratio of my numbers over the numbers from literature.

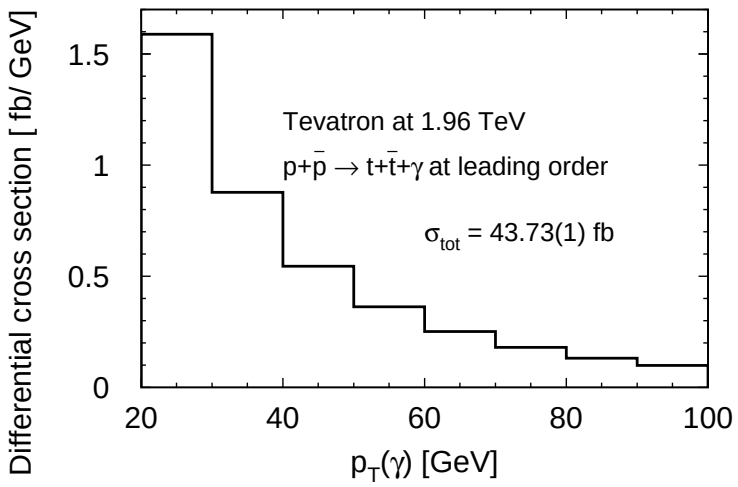

Figure 7: Differential cross section as function of the transverse momentum of the photon.

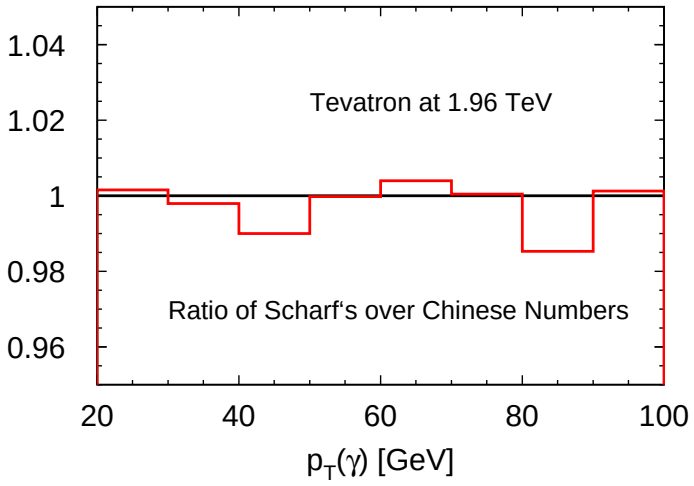

Figure 8: Comparison of transverse momentum distribution at the Tevatron. Shown is the ratio of my numbers over the numbers from literature.