Radiating top quarks
Gosselink, M.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
B.1 MC@NLO, Alpgen, and AcerMC

The following figures show comparisons between MC@NLO, Alpgen, and AcerMC of the transverse momentum distributions of top quarks, $t\bar{t}$ pairs, and jets in semi-leptonic $t\bar{t}$ events at $\sqrt{s} = 14$ TeV. All distributions are normalised to unity.

**Figure B.1:** Transverse momentum of the top quarks.

**Figure B.2:** Transverse momentum of the top quark pair.
Appendix B. Generator comparison

Figure B.3: Jet spectrum and transverse momentum of all jets ($p_T > 7$ GeV, $|\eta| < 5.0$).

Figure B.4: Transverse momentum of the leading and subleading jet.

Figure B.5: Transverse momentum of the first and second extra jet (not from top decay).
B.2 AcerMC/Pythia: ISR and FSR variation

Three different AcerMC/Pythia samples are available for the simulation of \( t\bar{t} \) events with full detector simulation (Appendix A). The samples have different settings for the initial state radiation and final state radiation parameters:

- ‘005205’ with the default ATLAS settings;
- ‘006250’ with enhanced ISR and reduced FSR;
- ‘006251’ with reduced ISR and enhanced FSR.

The variation in ISR and FSR parameters leads to either a higher (006250) or a lower (006251) reconstructed hadronic top mass. The impact on the selection, reconstruction, and combined efficiency for the \( t\bar{t} \) cross section measurement in Chapter 5 is demonstrated in Table B.1. Note the opposite effects on the selection and reconstruction efficiencies, which diminish the effect on the combined efficiency. This is similar to what is observed when varying the jet energy scale (Section 5.6.5).

<table>
<thead>
<tr>
<th>sample</th>
<th>muon channel</th>
<th>electron channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \epsilon_{\text{sel}} )</td>
<td>( \epsilon_{\text{rec}} )</td>
</tr>
<tr>
<td>005205</td>
<td>24.67</td>
<td>16.65</td>
</tr>
<tr>
<td>006250</td>
<td>27.45</td>
<td>15.86</td>
</tr>
<tr>
<td>006251</td>
<td>22.45</td>
<td>18.58</td>
</tr>
</tbody>
</table>

Table B.1: The selection, reconstruction, and combined efficiencies (in %) for \( t\bar{t} \) events in the electron and muon channel for various ISR/FSR settings in AcerMC.