Radiating top quarks
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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).

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<th>sample</th>
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<th>electron channel</th>
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<td>$\epsilon_{\text{rec}}$</td>
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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.