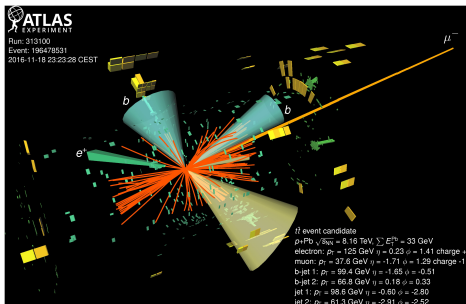


Top-Quark Pair Modelling and Uncertainties

Author: Pavlo Yefanov

Mentors: Nedaa-Alexandra Asbah, Tomas Dado

Top-quark pair process



- modeling top-quark pair is crucial for high energy physics
- top-quark is the most massive known particle, which means that it is likely to be involved in new physics
- top-quark pairs production tend to be major in backgrounds at beyond standard model energy scale

Monte Carlo Generators

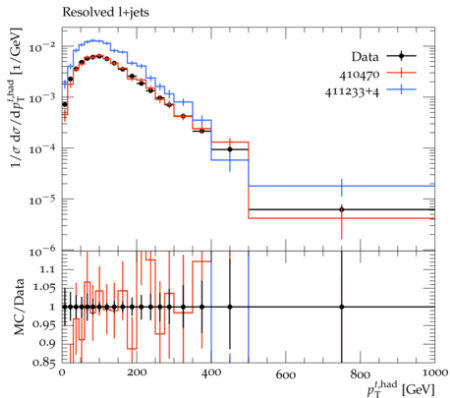
- Plethora of Monte Carlo generators exists for modeling pair processes of top-quarks
- Different generators used for calculations of matrix elements, simulation of parton showering, hadronisation and multiple-parton interactions. Several examples of them are PowHeg+Pythia8, PowHeg+Herwig7, Sherpa etc.

Rivet



- Rivet is set of tools for analyzing MC generators results
- Rivet allows you to write your own and use huge libraries public routines for analysis
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Comparison of results



This is example plot of comparison of results of two different MC generation. It depicts single- and double-differential cross-section measurements are presented for the production of top-quark pairs, in the lepton+jets channel at particle level. Red lines refer to Powheg+Pythia8 generator, when blue ones are Powheg+Herwig7 generator.