First look at jet cone size effects

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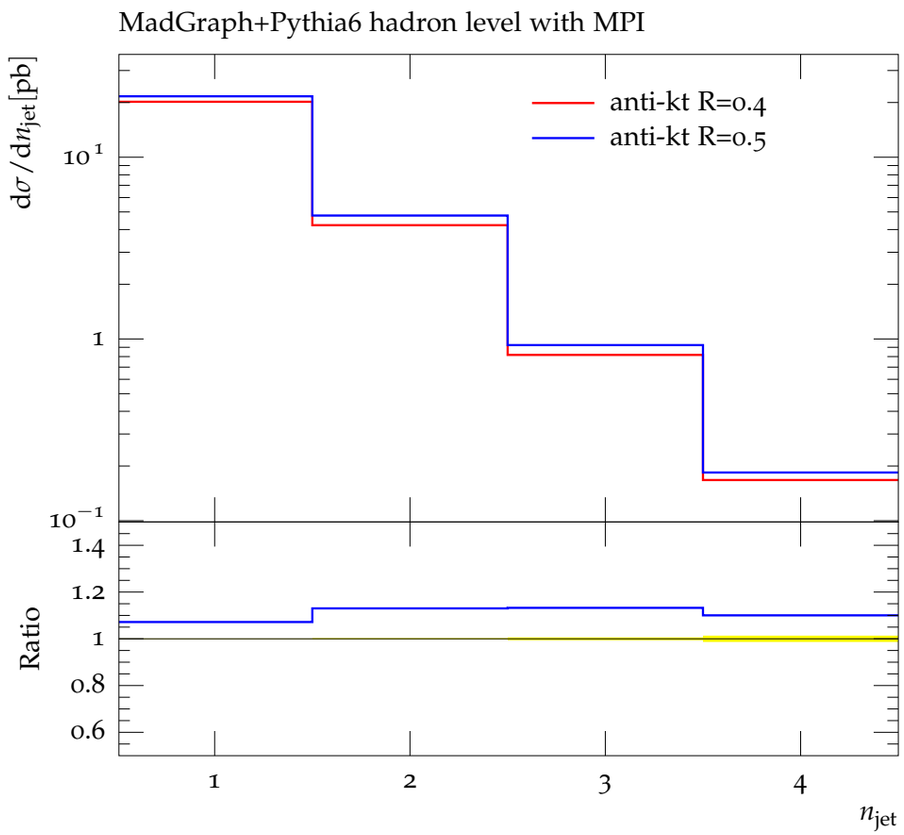
Common Phase Space (only a benchmark)

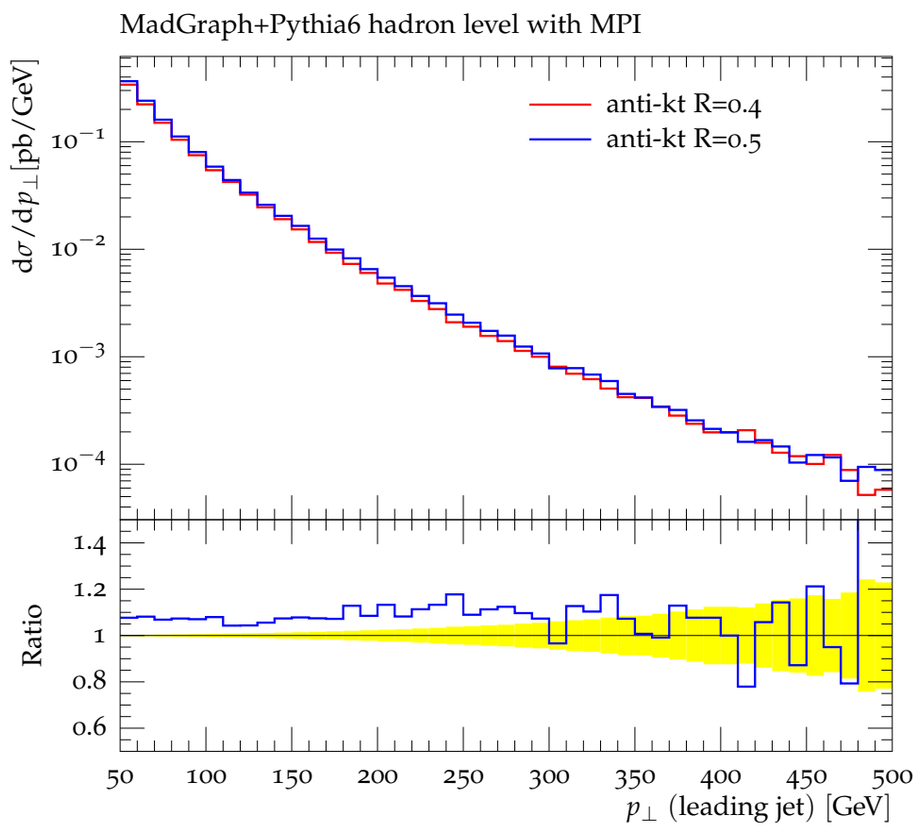
- Lepton selection
  - pT>20 GeV/c
  - |η|<2.4
  - 71<mll<111 GeV
- Jet selection
  - pT>30 GeV/c
  - |η|<2.5
  - ΔR>0.4 wrt to leptons
  - at least one jet

- First look at differences between results using anti-kt with a cone size of 0.4 (ak4) and 0.5 (ak5)
- The study has been done on Z events generated with MadGraph4+PYTHIA6 using RIVET

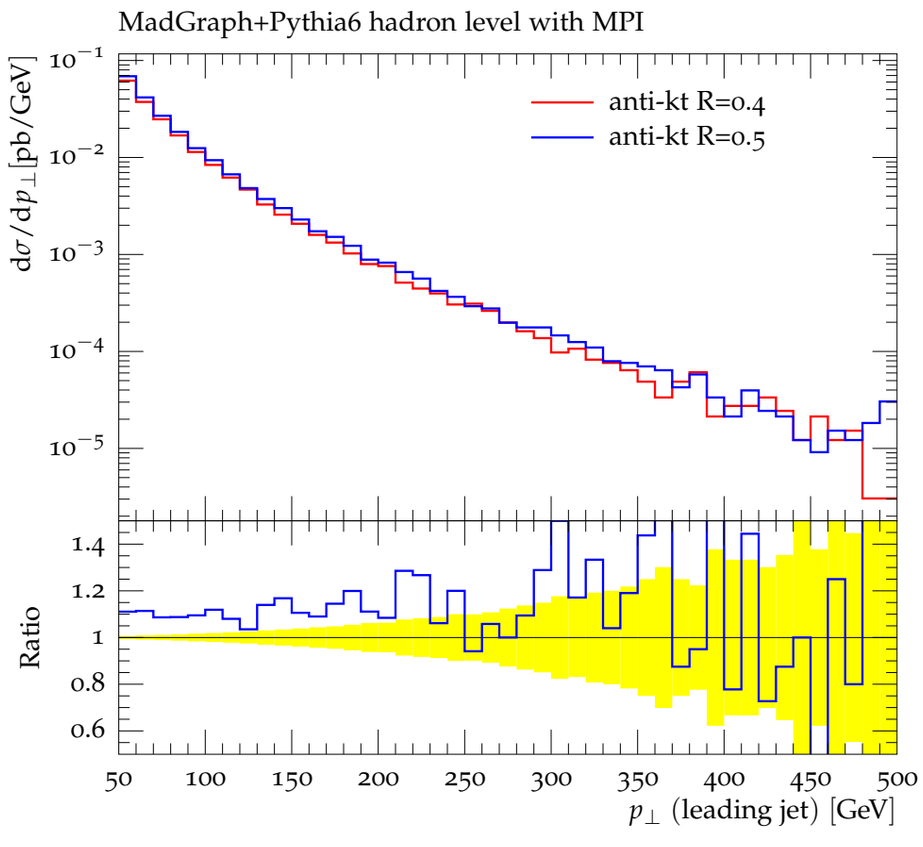
Number of jets



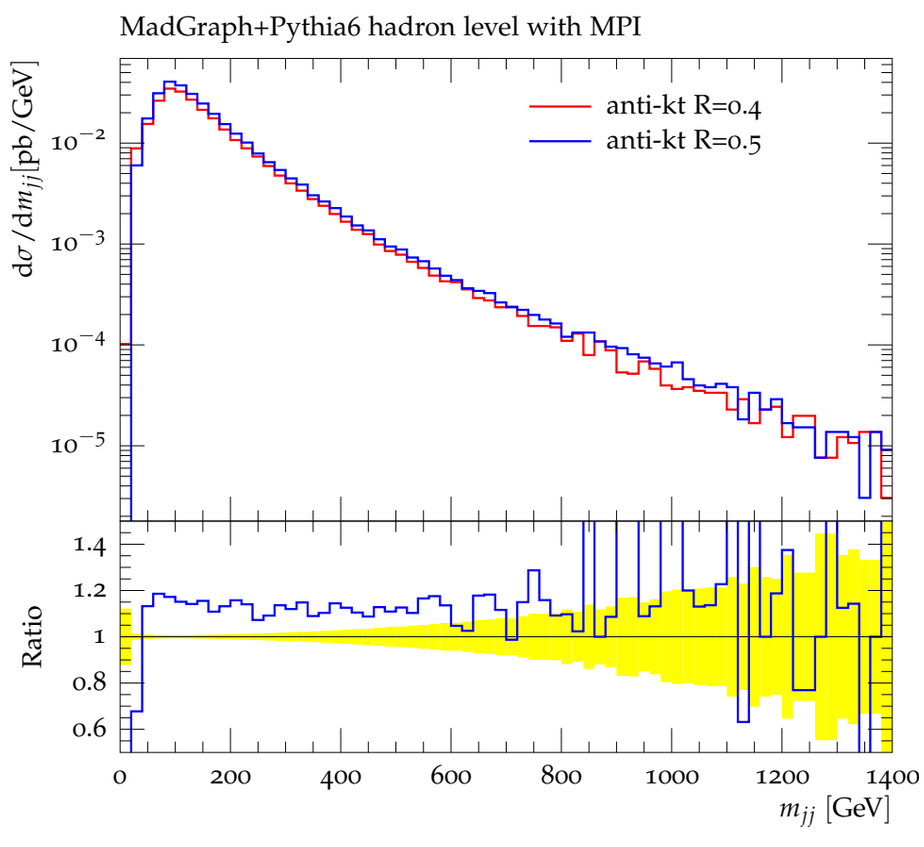
p_T of leading jet



p_T of second jet

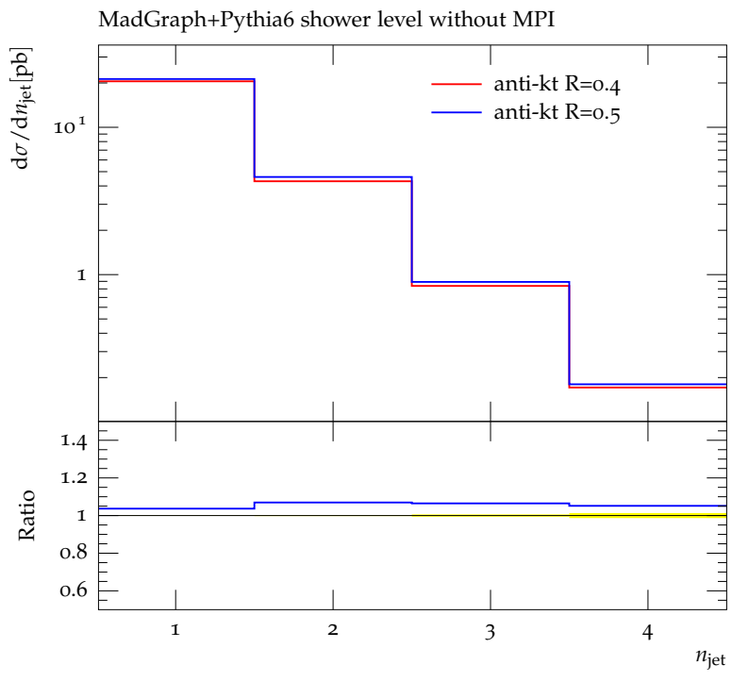


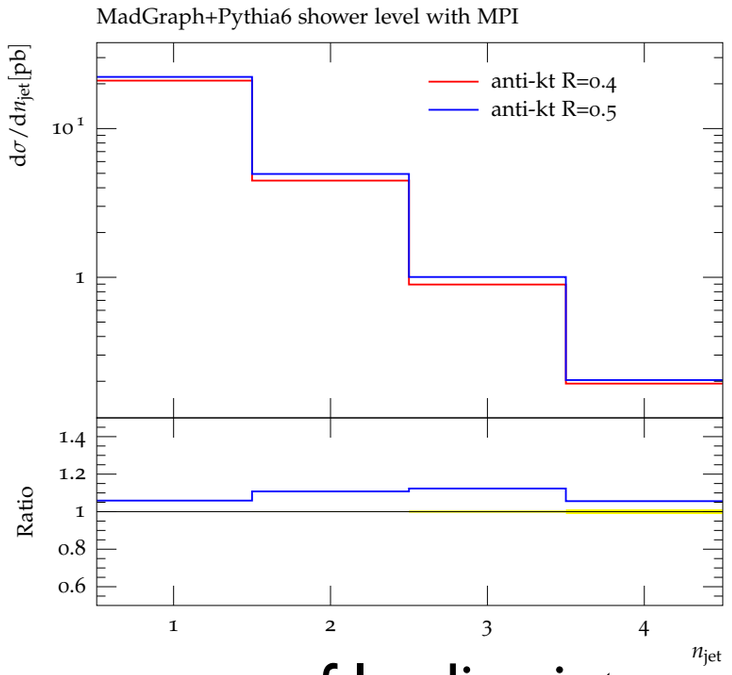
Di-jet mass

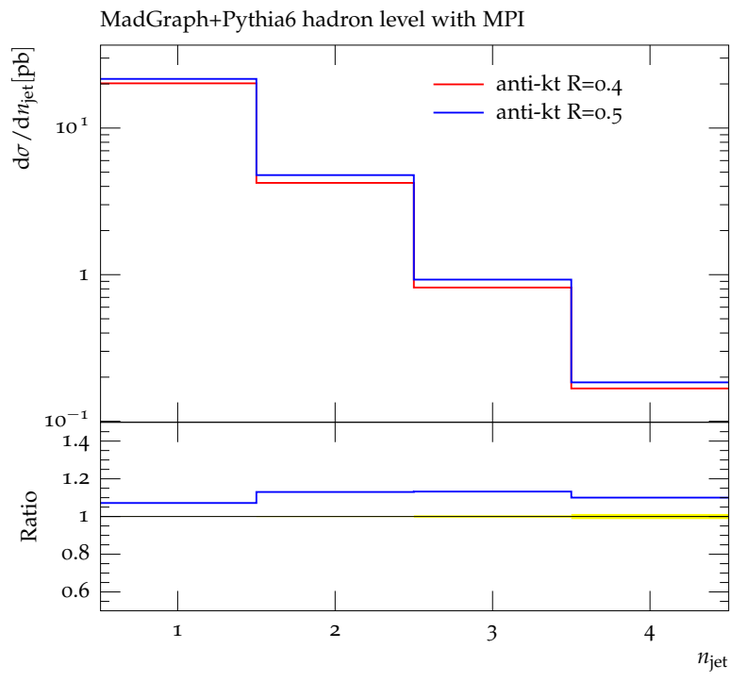


- Effects are order of 10%
- About 1/2 wo/ MPI
- Similar w/ or wo/ hadronization

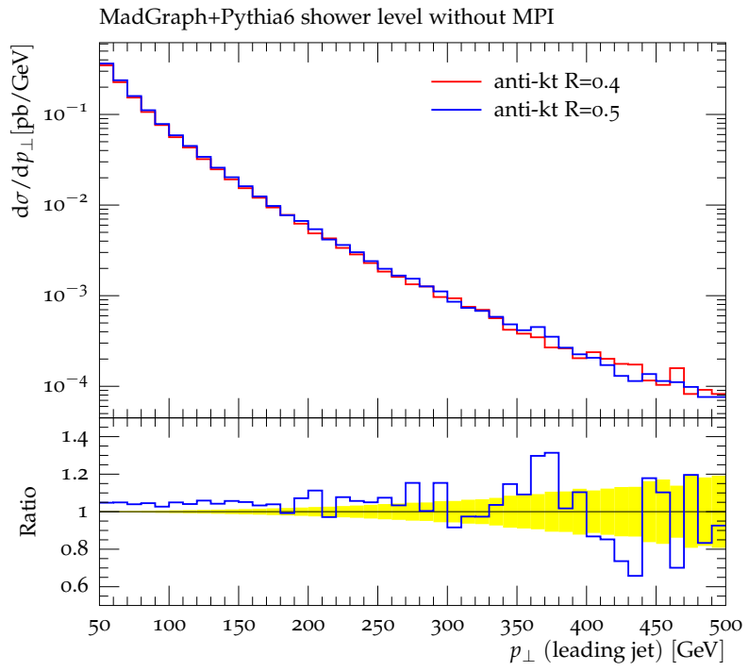
number of jets

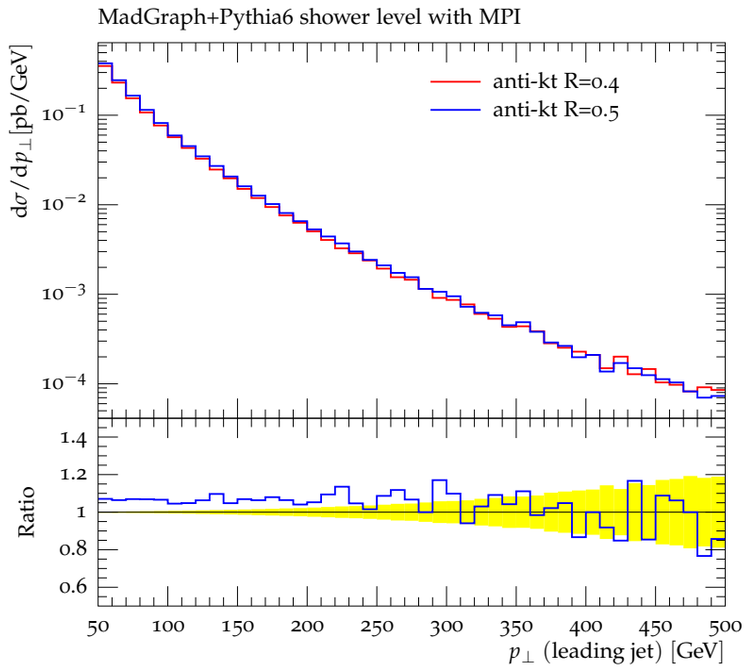


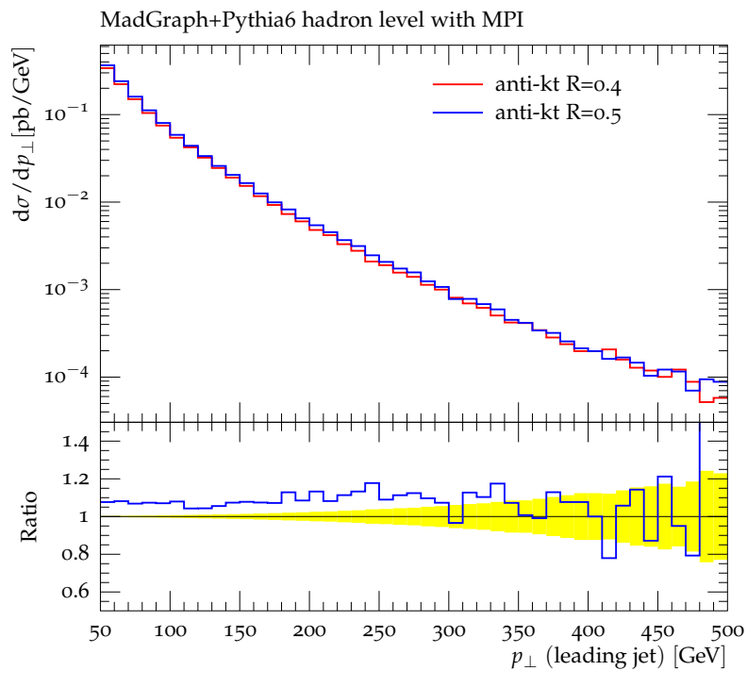




pT of leading jet







parton shower without mpi

parton shower with mpi

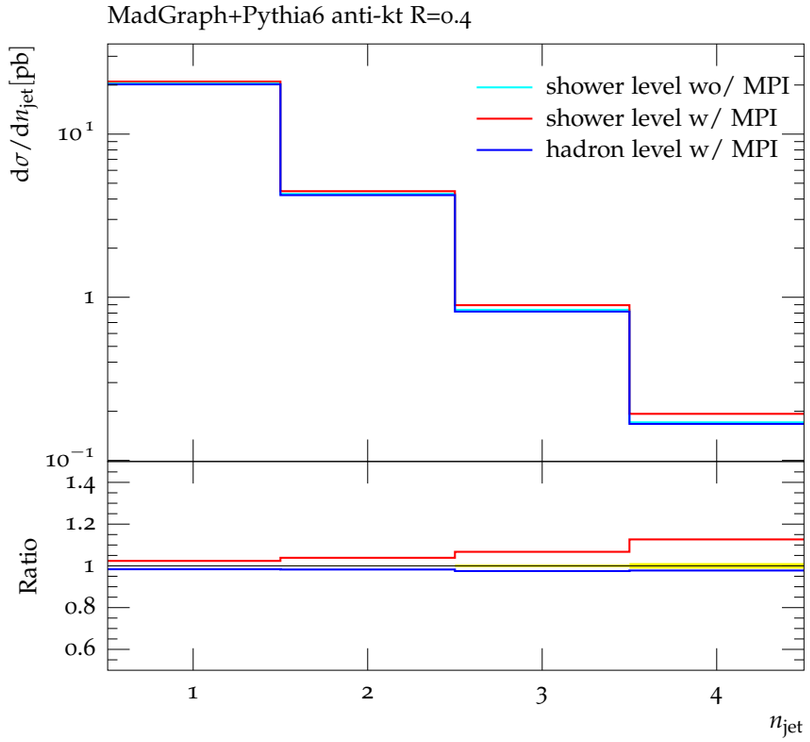
after hadronization

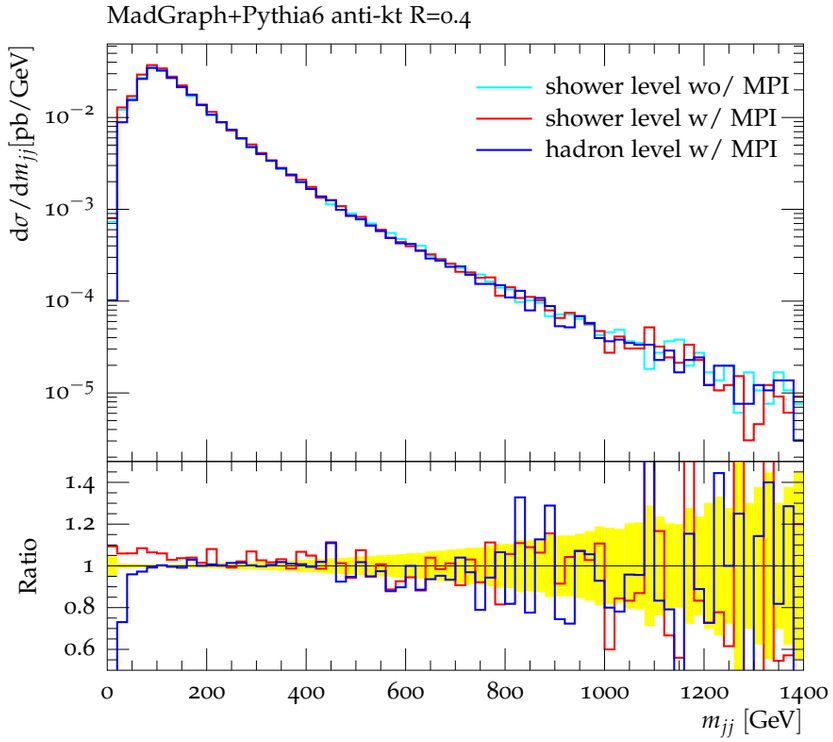
- MPI and hadron corrections are also ~10% (and opposite direction...)
- Can be slightly different depending on the jet cone size R

Number of jets

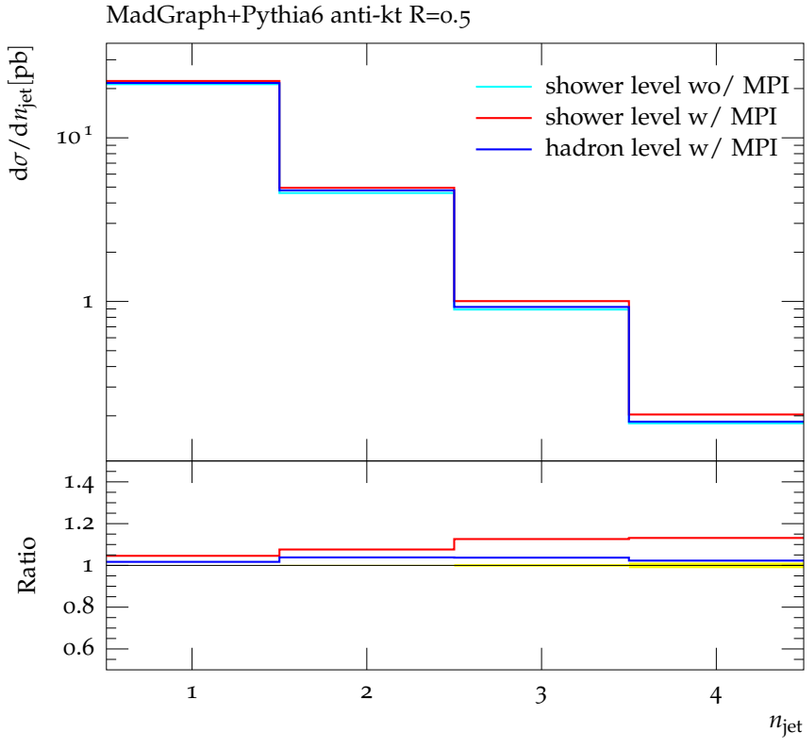
Di-jet mass

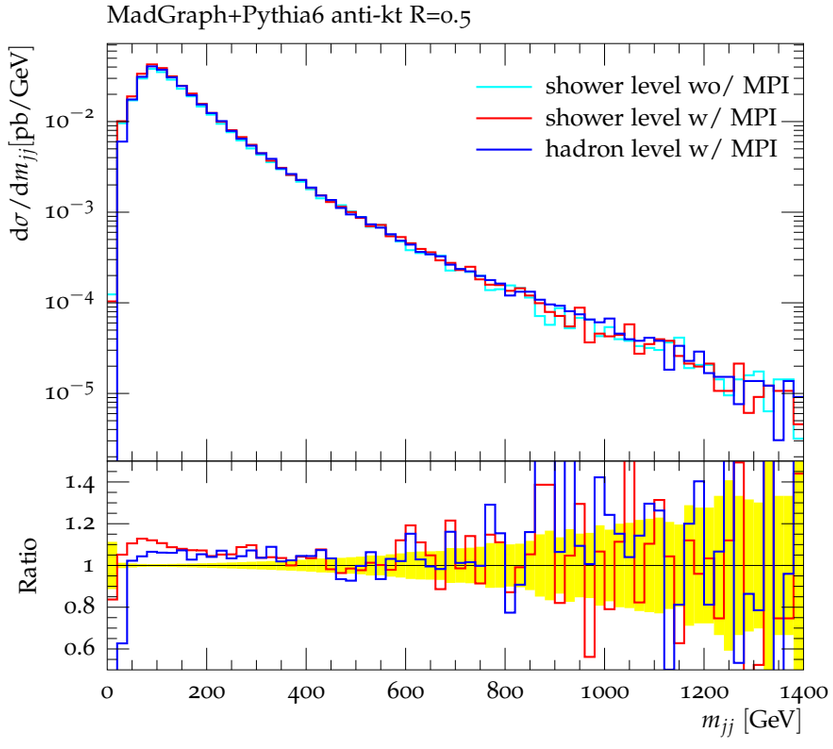
R=0.4





R=0.5





Summary

- Just a first look...
- Need to understand which systematics must be considered
  - MPI
  - hadron
- What else?
  - scale?
  - matching?
- It is only interesting for the ATLAS/CMS comparison or do we learn something from results with several jet cone sizes?