

# $t\bar{t}b\bar{b}$ aMCatNLO production update

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## Fixed Order LO/NLO sanity check

- Not out of the box in aMCatNLO, should be implemented writing a dedicated "analysis" routine inside aMCatNLO
- From e-mail in 10/11/2015 Zack and Eric from UVA volunteered to implement this
- Waiting for their inputs

## NLO Production Status

- Production of NLO showered events needs 3 steps:
  - Gridpack production
  - LHE events production
  - Showering of LHE files
  - Additional step is running Rivet routine
- Gridpacks produced for nominal, sys up and sys down at NLO (varying the resummation scale up/down according to twiki)
- Difficulties in producing gridpacks, had to switch off IREGI (tensor integral reduction tool) according to Rikkert instructions
- Showering with Pythia8 required additional commands to produce stable top quarks as required by Rivet routine (6:mayDecay = false)
- Production of nominal samples started within ATLAS batch system. At the moment  $\sim 5\text{M}$  showered events stored in eos
  - Events grouped in individual hepmc files of 50k showered events

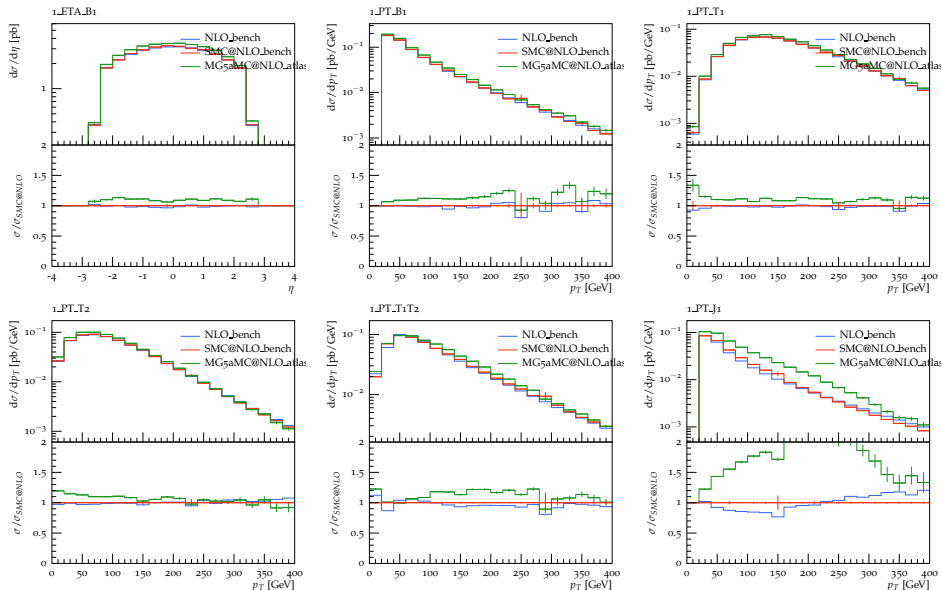
# Storage space and time consumption statistics

- Gridpack size:  $\sim 750$  MB each
- Gridpack prod time:  $\sim 65$  h each
- Non showered events size:  $\sim 10$  MB for 50k events
- Non showered events prod time:  $\sim 14$  h for 50k events
- Showered events size:  $\sim 1$  GB for 50k events
- Showered events prod time:  $\sim 10$  min for 50k events
  - Overall production time can suffers of batch queue related problems. Not possible to predict or to control
- Rivet analysis running time:  $\sim 10$  min per file

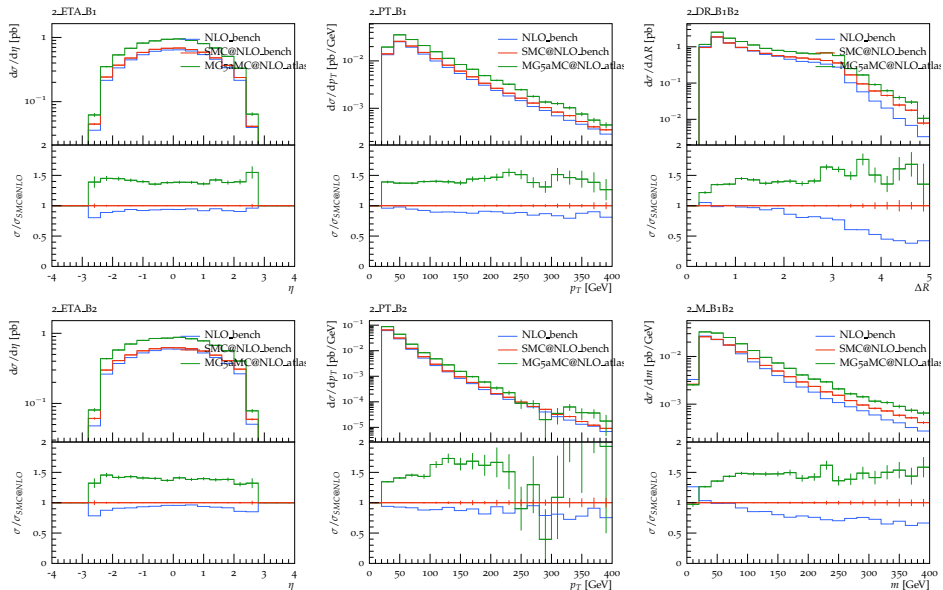
## Final Remarks

- Production is working fine and ready to produce more events
- Not possible to reach big statistics ( $>$  few millions) for storage space reasons (100M events require 2 TB, e.g. eos gives max 1 TB space)
- Ready do start with sys asap

# Analysis with $t\bar{t} + \geq 1$ $b$ -jets



# Analysis with $t\bar{t} + \geq 2$ $b$ -jets



# Analysis with $t\bar{t} + \geq 2$ $b$ -jets

