

Cascade developer meeting

- Hope that you are all ok !

PB-jet publication from MC school: comments I

- Comments I:
 - There is still need for a short description of cascade in section 2 I guess?
 - In line 145-146 (end of the 4th paragraph of section 3), it is written that the angular ordering condition of Pythia6 is used. Is that correct?
 - The second sentence in the 5th paragraph of section 3 could be reformulated, it is not very clear now.
 - In line 186, the first sentence of the 4th paragraph of section 4 should maybe be more clearly written. Or would it be clear for all readers that MCatNLO+CAS3 uses the PB-TMD and the TMD parton shower?

PB-jet publication from MC school: comments II

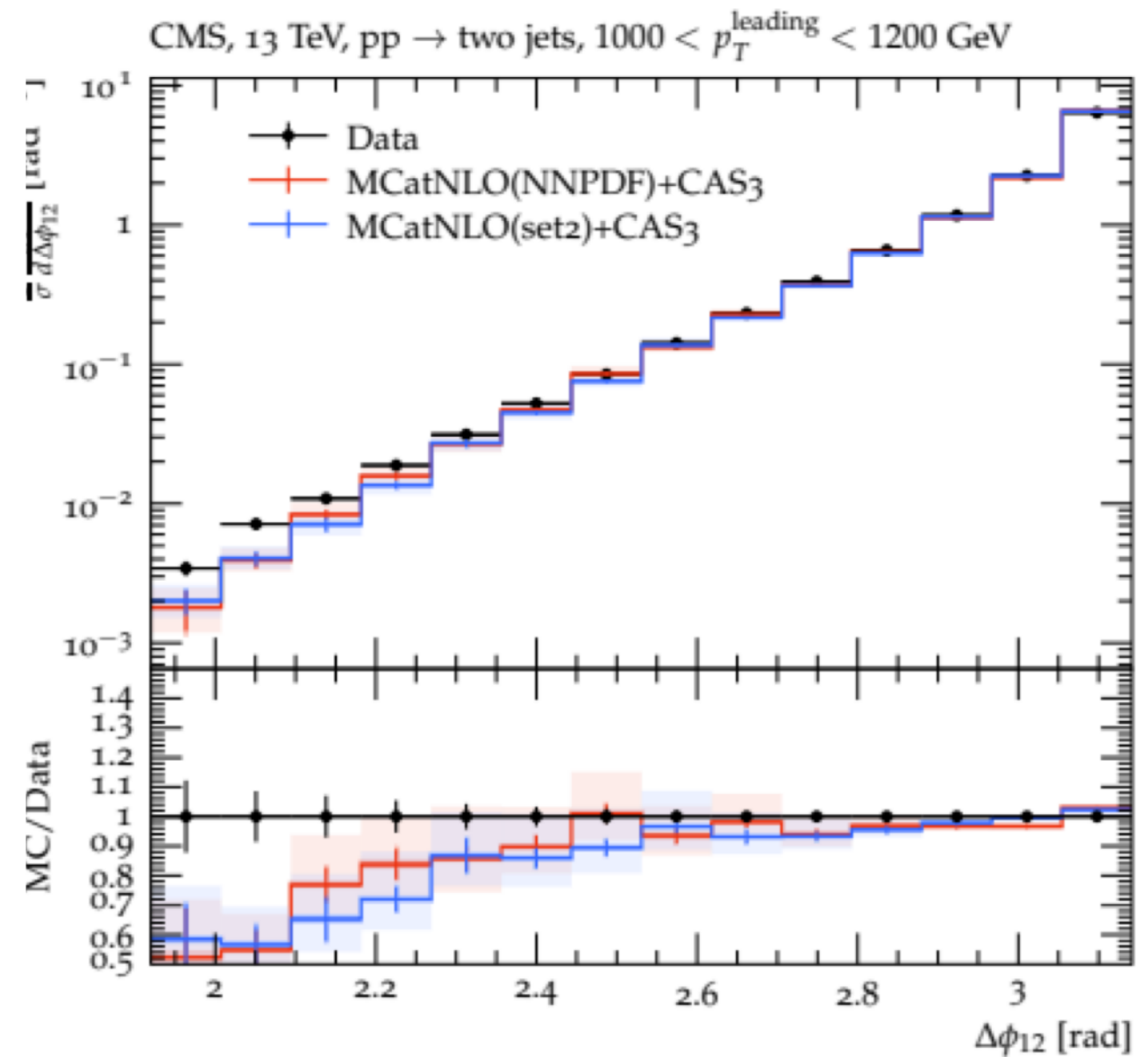
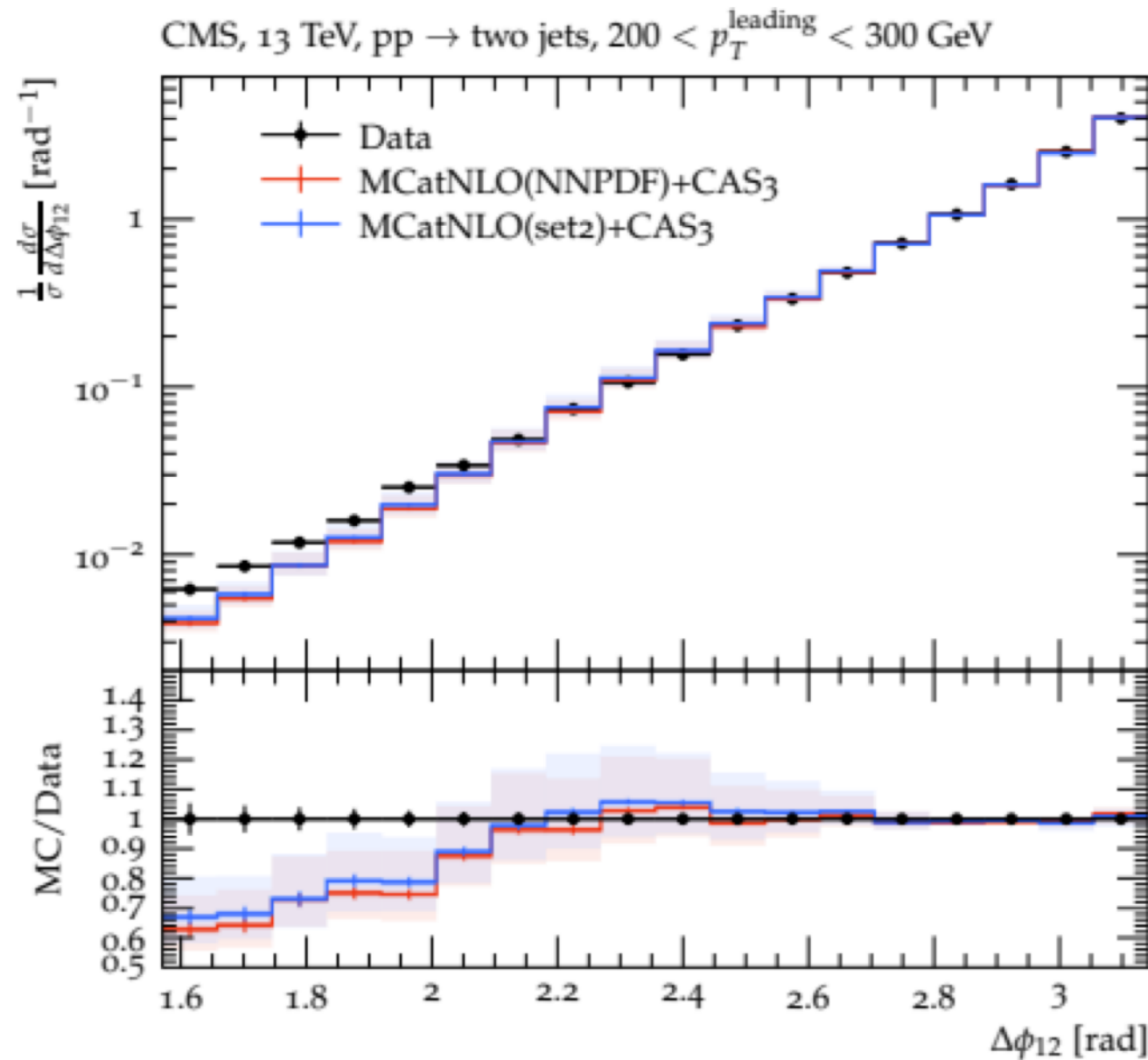
- Comments II:
 - In line 186, the first sentence of the 4th paragraph of section 4 should maybe be more clearly written. Or would it be clear for all readers that MCatNLO+CAS3 uses the PB-TMD and the TMD parton shower?
 - L49-51: The switch back and forth from a discussion in terms of orders of α_S in the ME to leading logs in the resummation is somewhat confusing. Perhaps this needs an extra sentence to explain? Or could the discussion on resummation be moved to another point in the text?
 - L50-55: I suppose that NLO calculations describe the data much better and that the 50% deviations are observed for LO predictions? Perhaps one cannot make a unique statement for NLO and LO together?
 - L107: I think “subtraction terms” may need some more explanation. I added “where subtraction terms are included to avoid double counting of parton emissions described by the matrix element calculation and the provided by the parton shower. This last set of events thus needs to be supplemented with a parton shower to provide a physical cross section”. Is that OK?
 - L114: Also “events and counter events” may need some more explanation... I don’t understand how events and counter events are combined in single event. Aren’t counter events not just separate events with a negative weight?
 - L125: What is the physical meaning of SCALUP? Can we give a description and not just the variable name from the code?
 - L118-126: I suppose there are also counter events in the MC@NLO mode, no? Perhaps the paragraph should start with something like “In the MC@NLO mode, in addition to counter events, subtraction terms are included ...”

Issues from last discussion: fNLO & Rivet

- Novel way to calculate fNLO with Rivet
 - use madgraph5_aMCatNLO to calculate dijets at fixed NLO
 - write events in LHE format
 - split huge lhe file into smaller file (with tool from S. Prestel)
 - run CASCADE3 in fNLO mode to process lhe files
 - read produced hepmc file with Rivet and fill histos
- X-check with histos from madgraph5_aMCatNLO
 - good agreement
 - plots will be included in presentation later :)

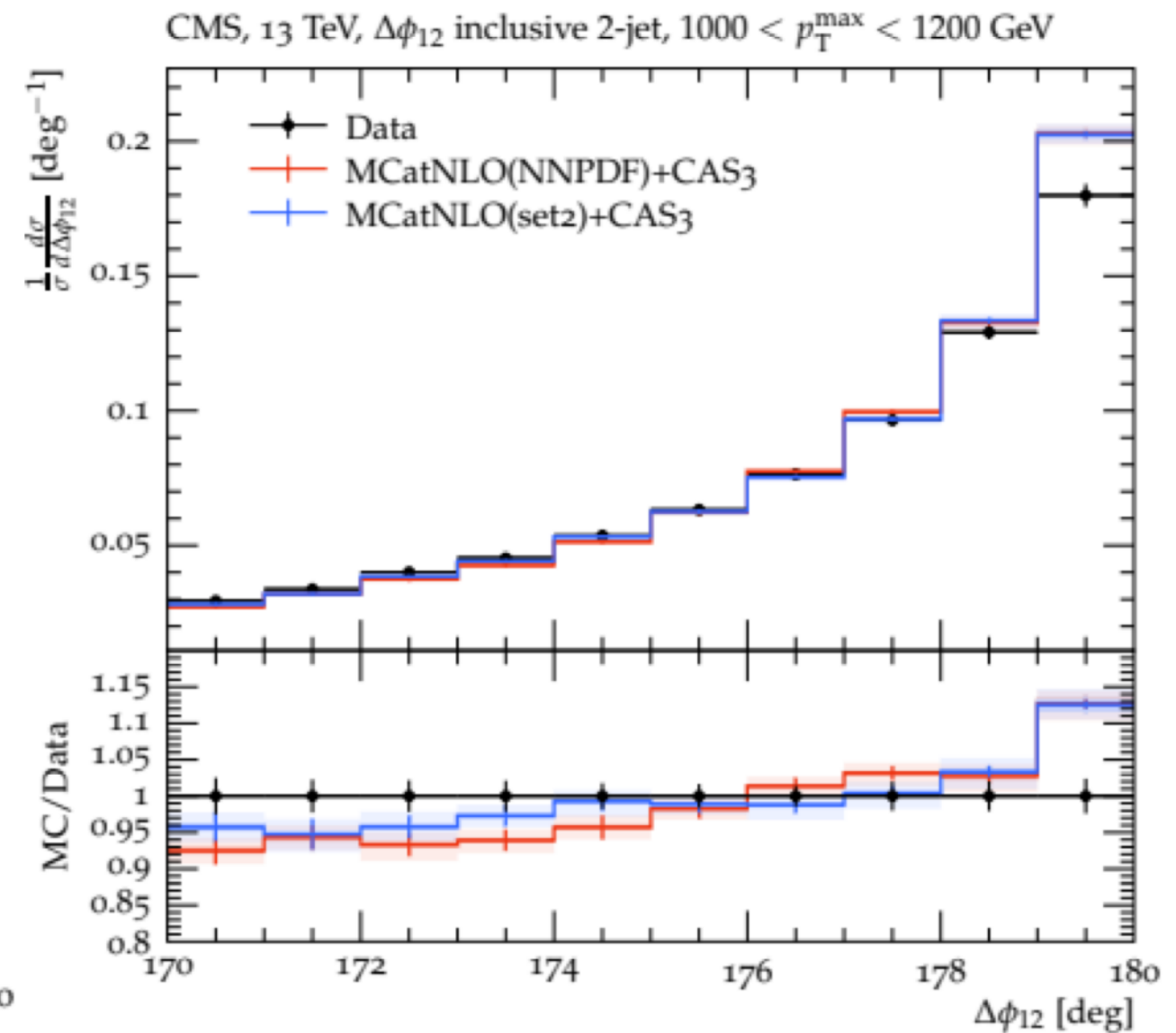
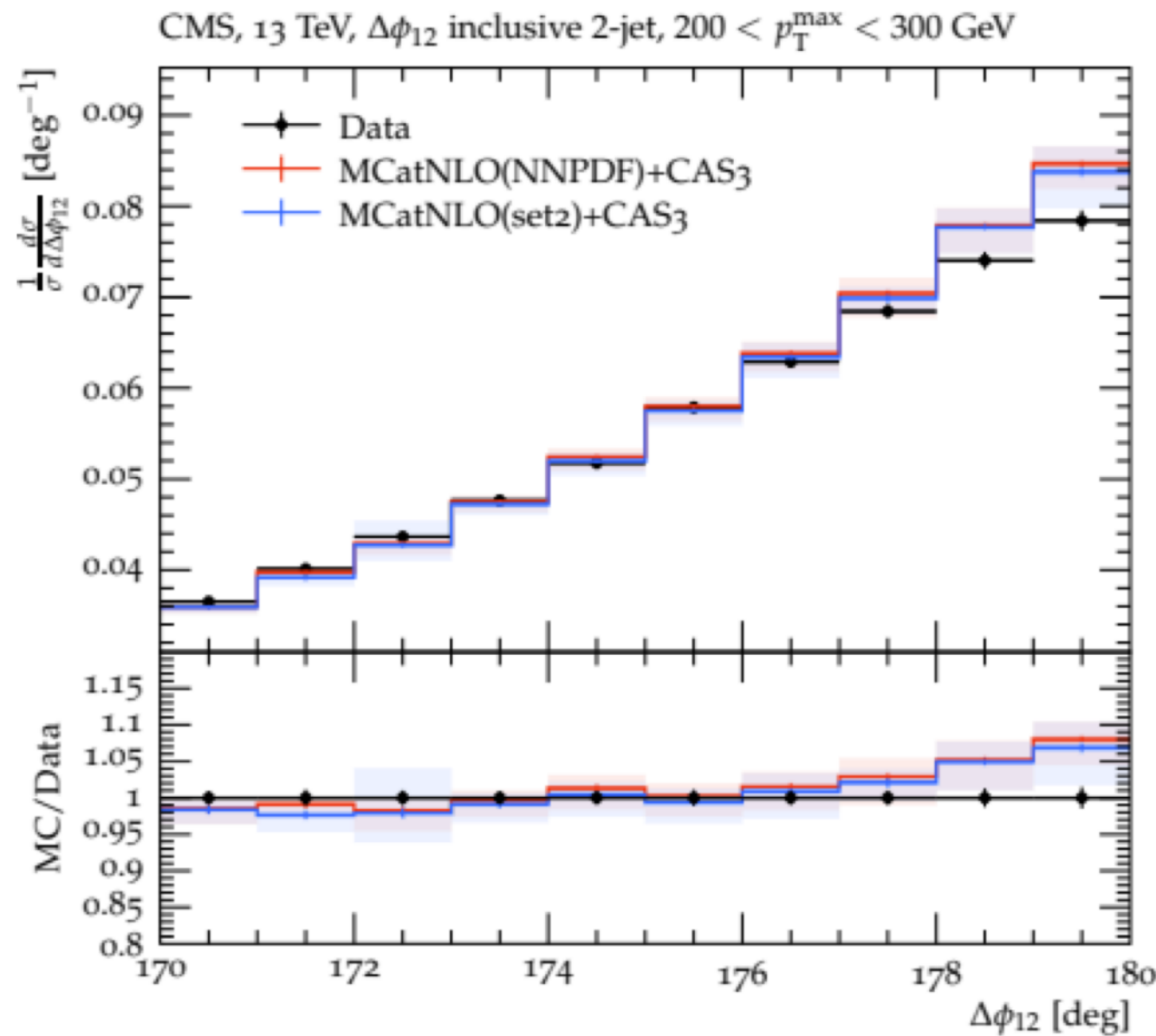
Dependence on collinear pdfs

- use different collinear pdfs for calculation of NLO xsection (NNPDF31NLO instead of PB set2)



Dependence on collinear pdfs (back-to-back)

- use different collinear pdfs for calculation of NLO xsection (NNPDF31NLO instead of PB set2)



Shower uncertainties in P8

- Thanks to Stefan, some issues could be solved
- new results to come in a day or so

Other issues from discussion

- small $\Delta\phi$, mention merging:
 - in paper draft: “The region of low $\Delta\phi_{12}$ in Figs. 4 and 6 is not well described with an NLO dijet matrix element calculation supplemented with TMD densities and TMD parton shower because in the low $\Delta\phi_{12}$ region higher order hard emissions play a significant role. It has been shown in [59], that the inclusion of higher order matrix elements with the new TMD merging method of Ref. [41].”
- MPI contribution
 - in paper draft: “Shown in Fig. 8 is also the contribution from multiparton interactions, which is very small ... “
- time-like shower in initial state cascade
 - does not matter, since kinematics are fixed !

Summary

- Paper draft essentially ready
- Wait for P8 shower uncertainties to be included
- Check author list – anybody missing ?
- Please x-check paper text and plots
- Plan to submit to arXiv then on Monday !