Cascade developer meeting

Status of common papers
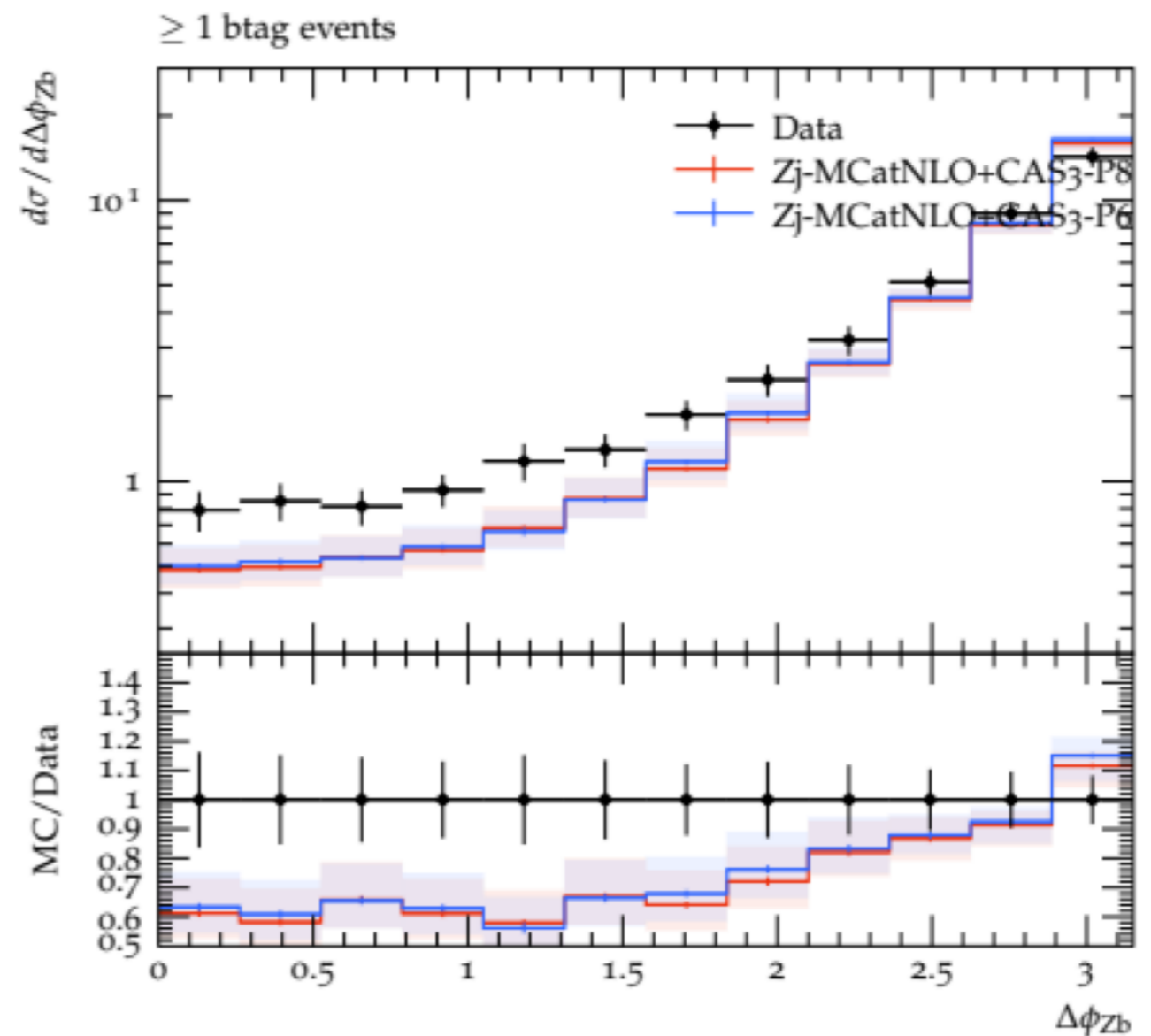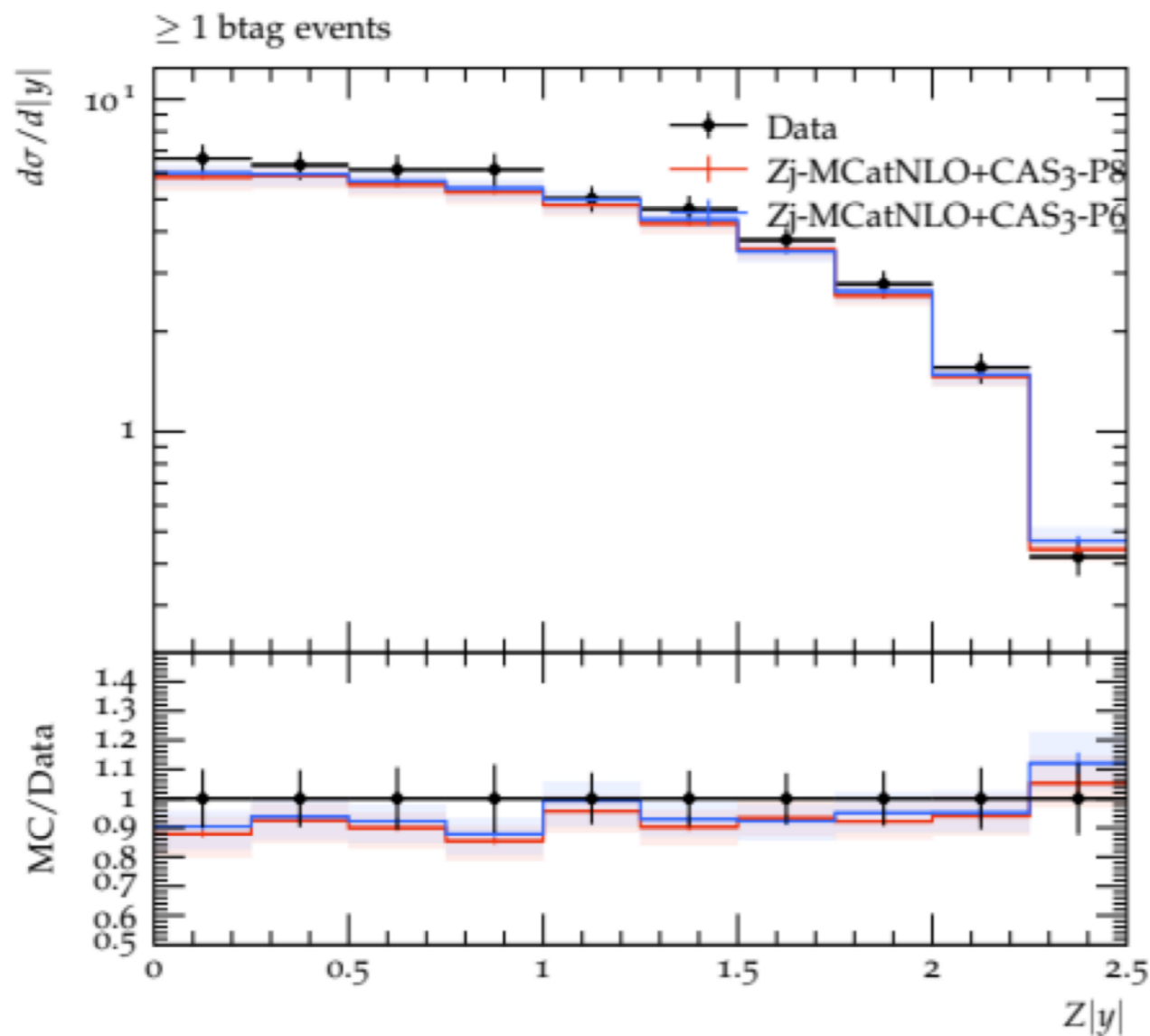
- Z+j correlation paper on arXiv: **2204.01528** and on EPJC 82, 755 (2022)
  - thanks a lot to all who contributed….

- Plans:
  - Investigation of low kt region with DY measurements at LHC
    - work for Itana's PhD together with Natasa, Fernando and DESY summer-students supervised by Sara
    - effects of intrinsic kt in DY at the LHC
    - flavor dependence
    - comparison with pA and AA

CASCADE news

- cascade-3.2.3 (on hepforge)
  - Bug in merging procedure found: normalization in hepmc file was wrong → corrected (thanks to Armando)

- New features: 3.2.4 ready
  - optional hadronization with pythia8
  - possibility to switch starting scale for IPS to shat of process
  - possibility for running IPS with collinear pdfs (instead of TMDs)
  - optional to set kt2min: minimum kt allowed from TMD
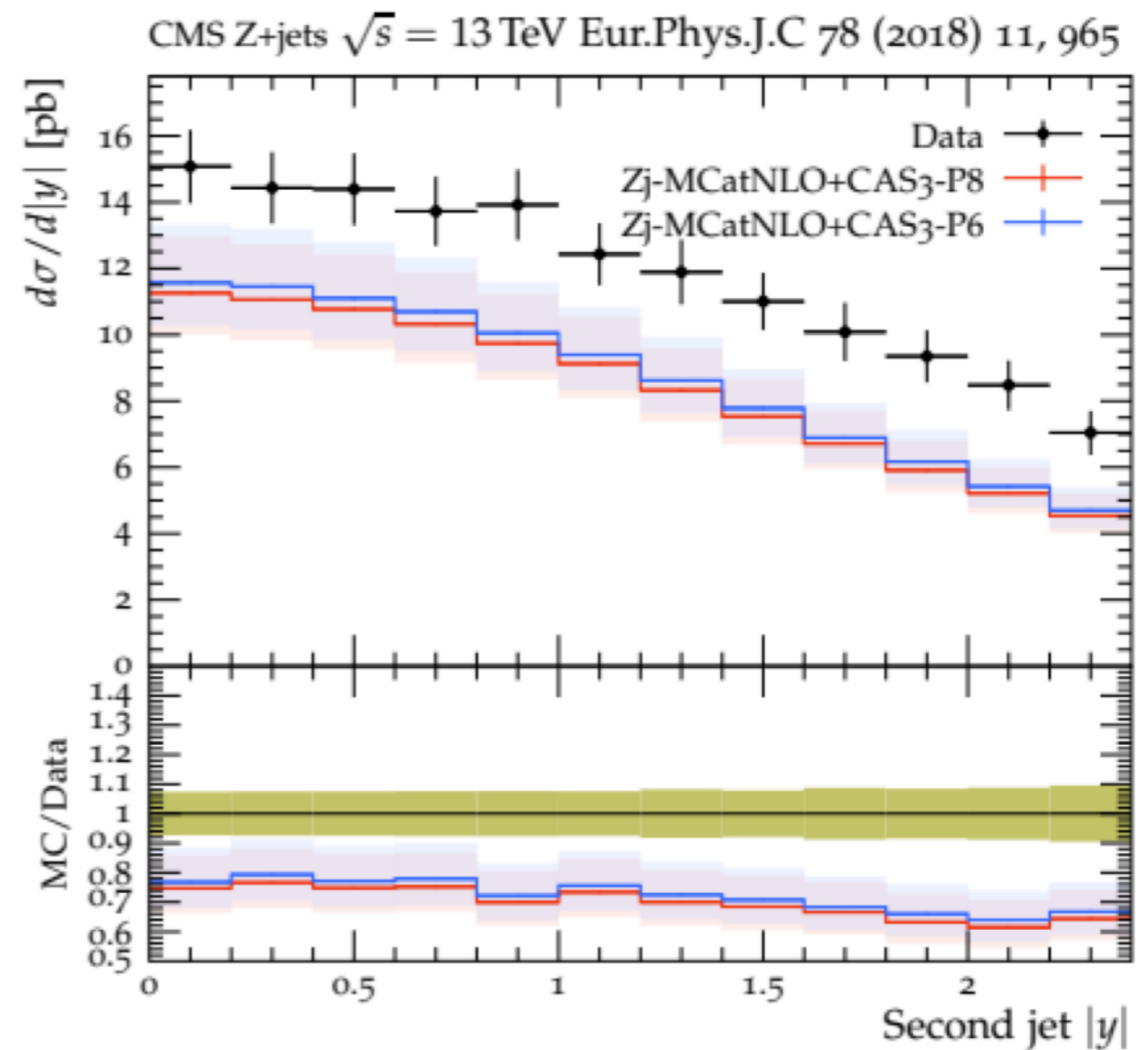
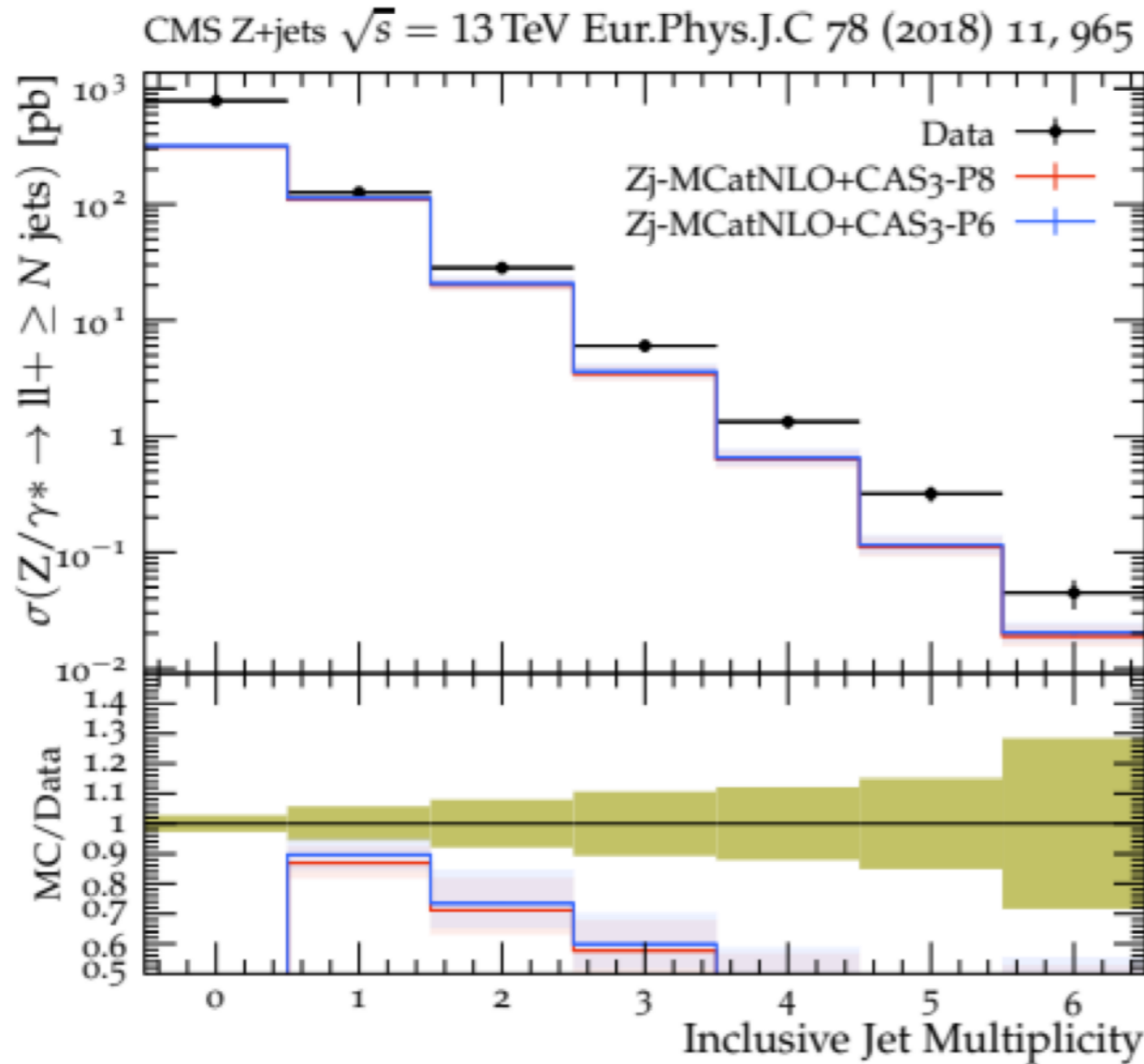# CASCADE with P6 and P8 hadronization

- Z+b jets (ATLAS_2020_I1788444)

- no significant difference between PYTHIA6 and PYTHIA8 hadronization
  - hard process, initial, final state PS kept identical, on hadronization changed

CASCADE with P6 and P8 hadronization
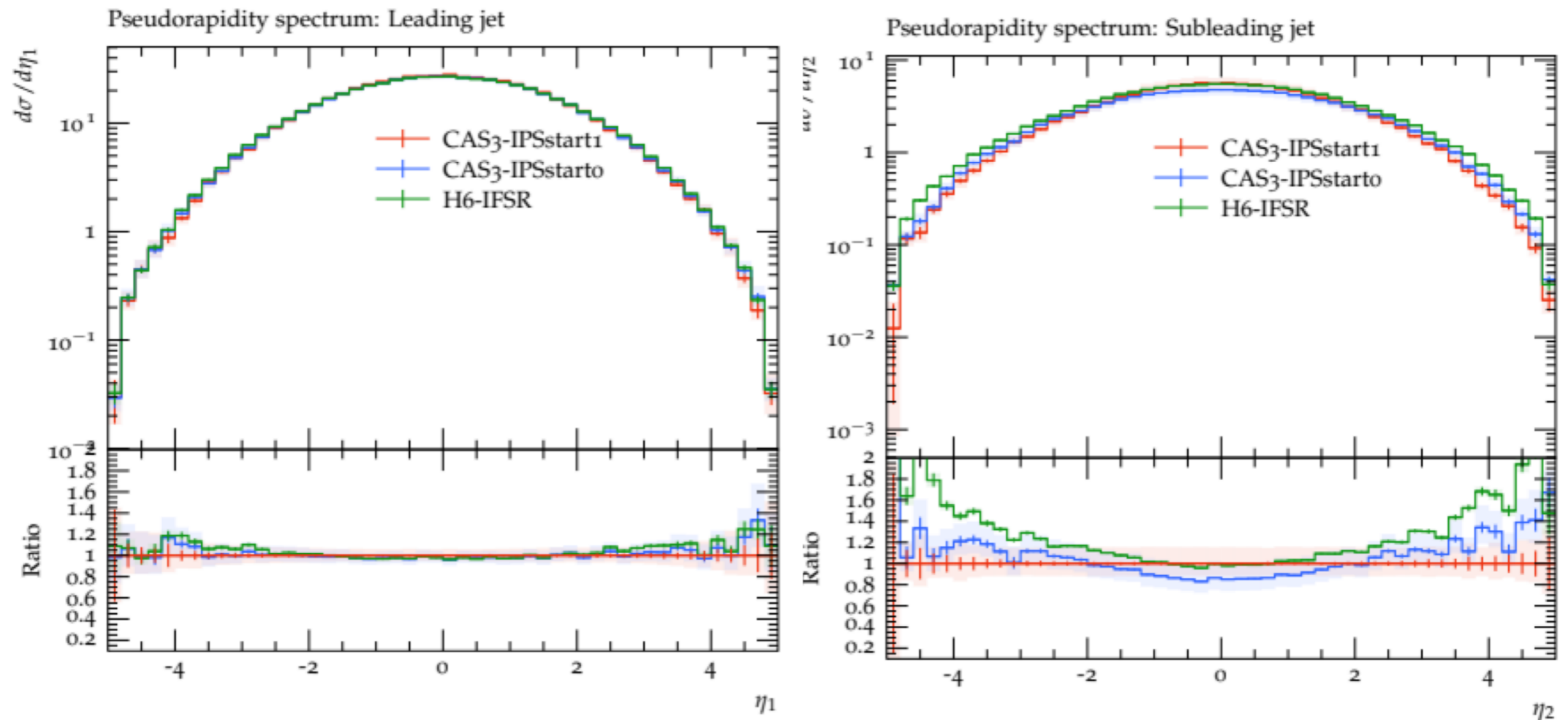
- Z+ jets (CMS_2018_I1667854)

- no significant difference between PYTHIA6 and PYTHIA8 hadronization
  - hard process, initial, final state PS kept identical, on hadronization changed

CAS: optional different starting scale for shower

- for TMD: $x\mathcal{A}(x, k_T, \mu)$

  with $k_T <$ scalup

  and $\mu =$ LHEscale

  LHEscale = 1: $\mu = \mathrm{shat}$

         = 2: $\mu = 1/2 \sum p_{ti}$

         = 3: $\mu = shat, 1/2 \sum p_{ti}$

  ...

- in IPS upper scale:

  IPSstart=0: $\mu =$ LHEscale

  IPSstart=1: $\mu =$ shat

CAS: optional different starting scale for shower
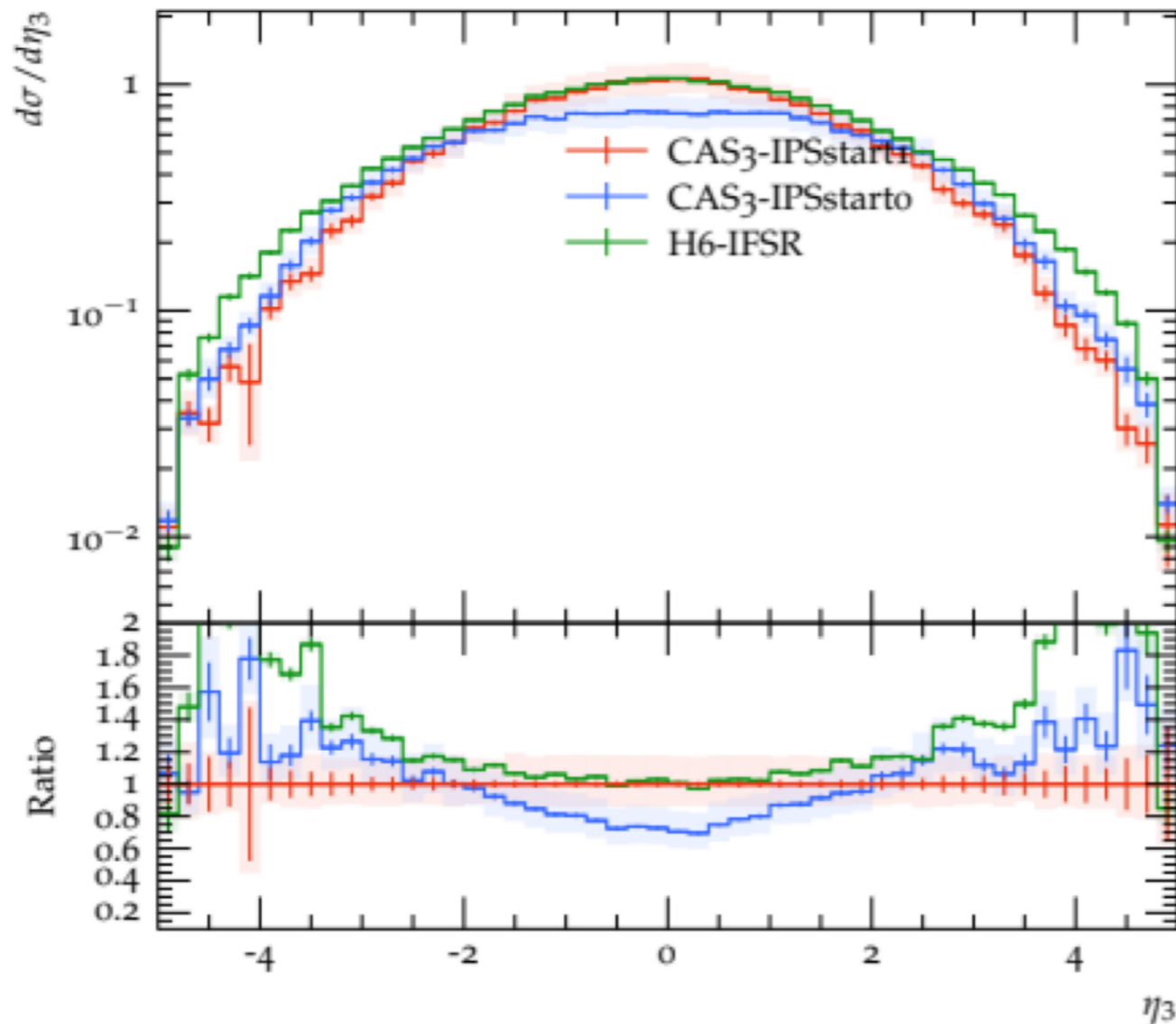
- Z+j: η distributions

- Rate of parton shower jets changes (within uncertainties)
- Comparison to H6 (default) shows differences in fwd/bck region

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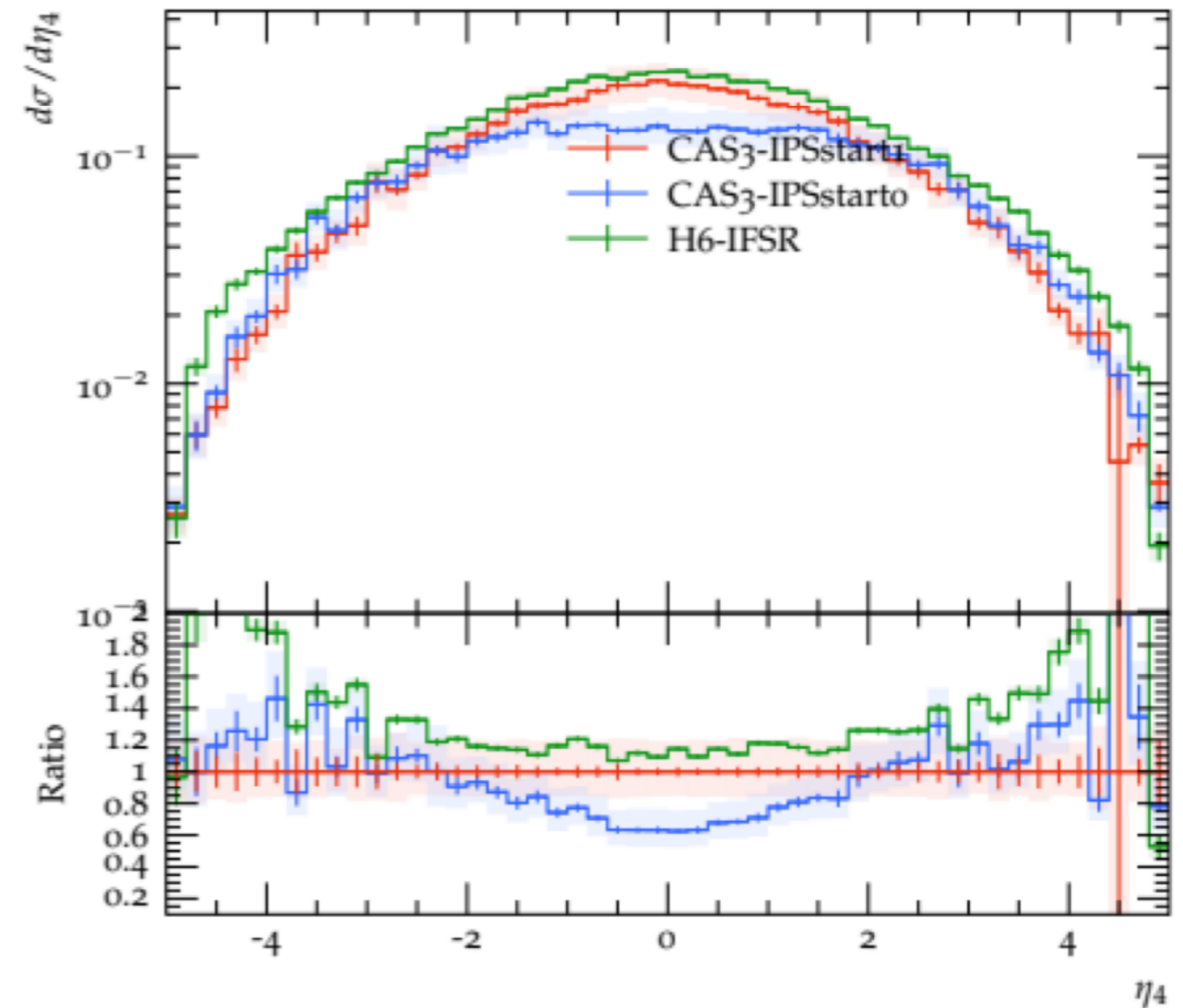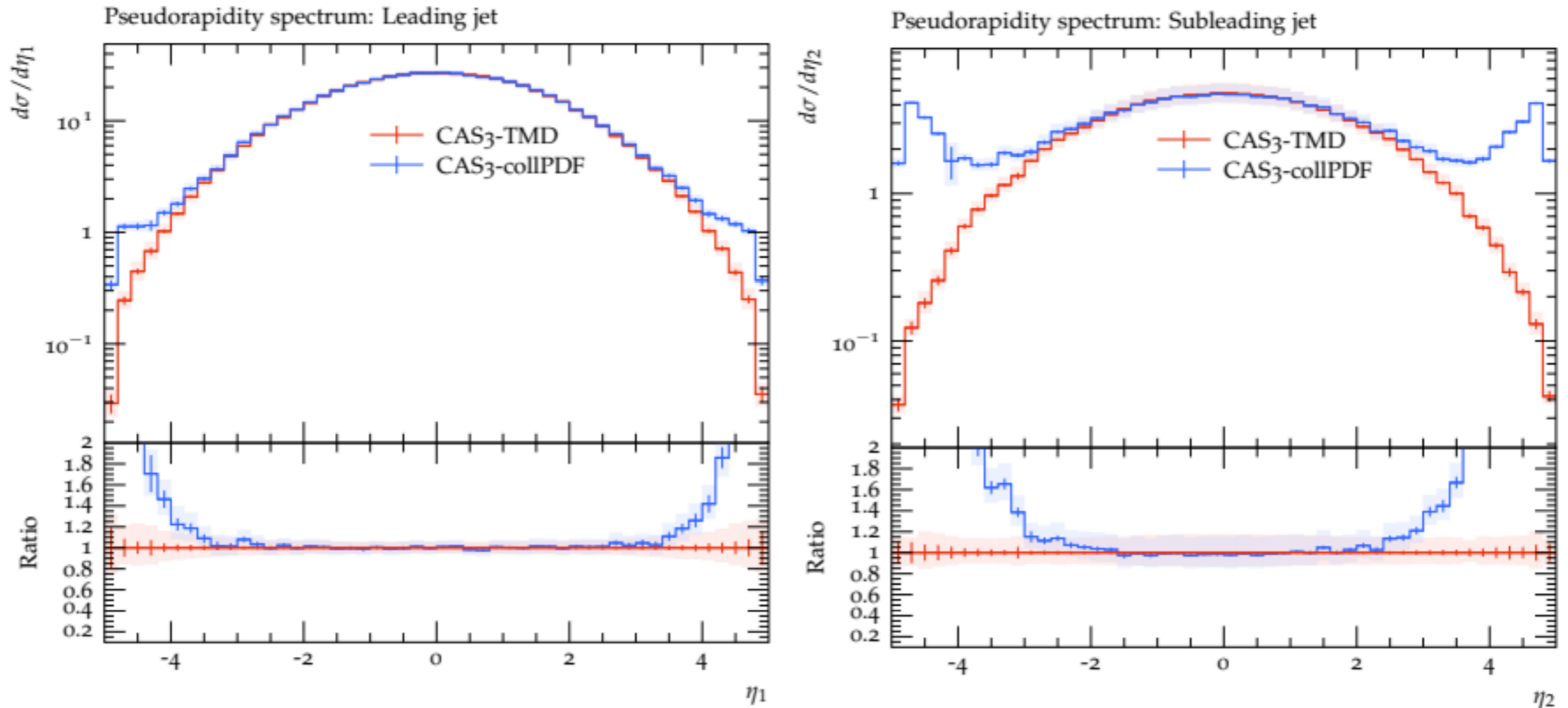- Comparison to H6 (default) shows differences in fwd/bck region

CAS: collinear PDF for IPS

- optional: use collinear PDF for IPS (instead of TMD)

  Z+j: η distributions

- Especially in fwd/bck region, constrains from TMD are important.

  - Note: standard PS works in parton-parton CMS frame,while TMD PS works in overall CMS

Structure of CASCADE group

- We have several publications which are produced by contributions from several people, like in a collaboration
  - when talks are given on topics of those common publications, they are given not as individuals, but **on behalf of the group**.
  - we have already a loose developer group, called now **CASCADE group**
    - this group is open, anybody can join, or drop out.
    - to be part of the group, contributions are required: https://credit.niso.org/ (thanks to P. Van Mechelen for pointing this out)

Conceptualization	Resources
Data curation	Software
Formal Analysis	Supervision
Funding acquisition	Validation
Investigation	Visualization
Methodology	Writing – original draft
Project administration	Writing – review & editing

  - at least **one** of the above criteria must be fulfilled to **qualify as co-author** !

Author-list discussion

- The discussion in LHC experiments is still ongoing on how to sign common publications, where all contributors are properly cited.
  - DESY does not allow publications together with scientists with russian affiliation

  - We have to find a proper solution, we do not want exclude anybody, who has contributed, from publications.

  - Let's see how LHC experiments decide, then we can discuss, whether to adopt a similar solution or do it differently.

Conferences

- REF 2022 (https://indico.desy.de/event/32950/)
  - Abstract submission deadline extended to 30. Sept
    - *Multijet and Zj azimuthal correlations – factorization breaking*
      - proposal: L. I. Estevez Banos
    - *Small kt region in PB method*
      - proposal: M. Mendizabal
    - *TMD merging*
      - proposal: A. Bermudez Martinez
    - *Global TMD fits*
      - proposal: S. Taheri Monfared
    - other ?

AOB

- Further news ?