

PB TMD meeting

- Hoping that you are all ok !

Next workshops

- LHPC 2020 25-30 May 2020 Paris (Deadline abstract: 13 April 2020)
 - “therefore we are trying to organise an online LHCP conference in the originally scheduled window of 25 to 30 May 2020. ”
 - What should we send in ?
 - “TMD densities at leading and higher order from the Parton Branching method”
 - “Drell-Yan production at NLO in the Parton Branching method at low and high DY masses and low and high \sqrt{s} ”
 - anything else ?

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Next workshops

- ICHEP 2020 30 July – 5 August Prague(now considering remote participation)
 - Jet production at NLO in the Parton Branching method at LHC energies
A. Bermudez, F. Hautmann

My abstracts

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616.TMD densities at leading and higher order from the Parton Branching method

Sara Taheri Monfared (Deutsches Elektrone...)

Last modified: 21 Feb 2020

Submitted

We present a new determination of Transverse Momentum Dependent (TMD) parton distributions obtained with the Parton Branching (PB) method at LO, NLO and NNLO. The PB TMDs are extracted from fits to precision DIS data using

800.Drell-Yan production at NLO in the Parton Branching method at low and high DY masses and low and high *sqrts*

Qun Wang (Peking University (CN))

Last modified: 25 Feb 2020

Submitted

Transverse Momentum Dependent (TMD) parton distributions obtained from the Parton Branching (PB) method are combined with next-to-leading-order (NLO) calculations of Drell-Yan (DY) production. We apply the MC@NLO method for

857.Parton Branching method and applications to pp and ep processes

Jindrich Lidrych (Deutsches Elektrone...)

Last modified: 26 Feb 2020

Submitted

Transverse Momentum Dependent (TMD) parton distributions obtained within the Parton Branching (PB) approach offer a wide spectrum of applications to describe processes in pp as well as in en interactions. We give an overview of the PR

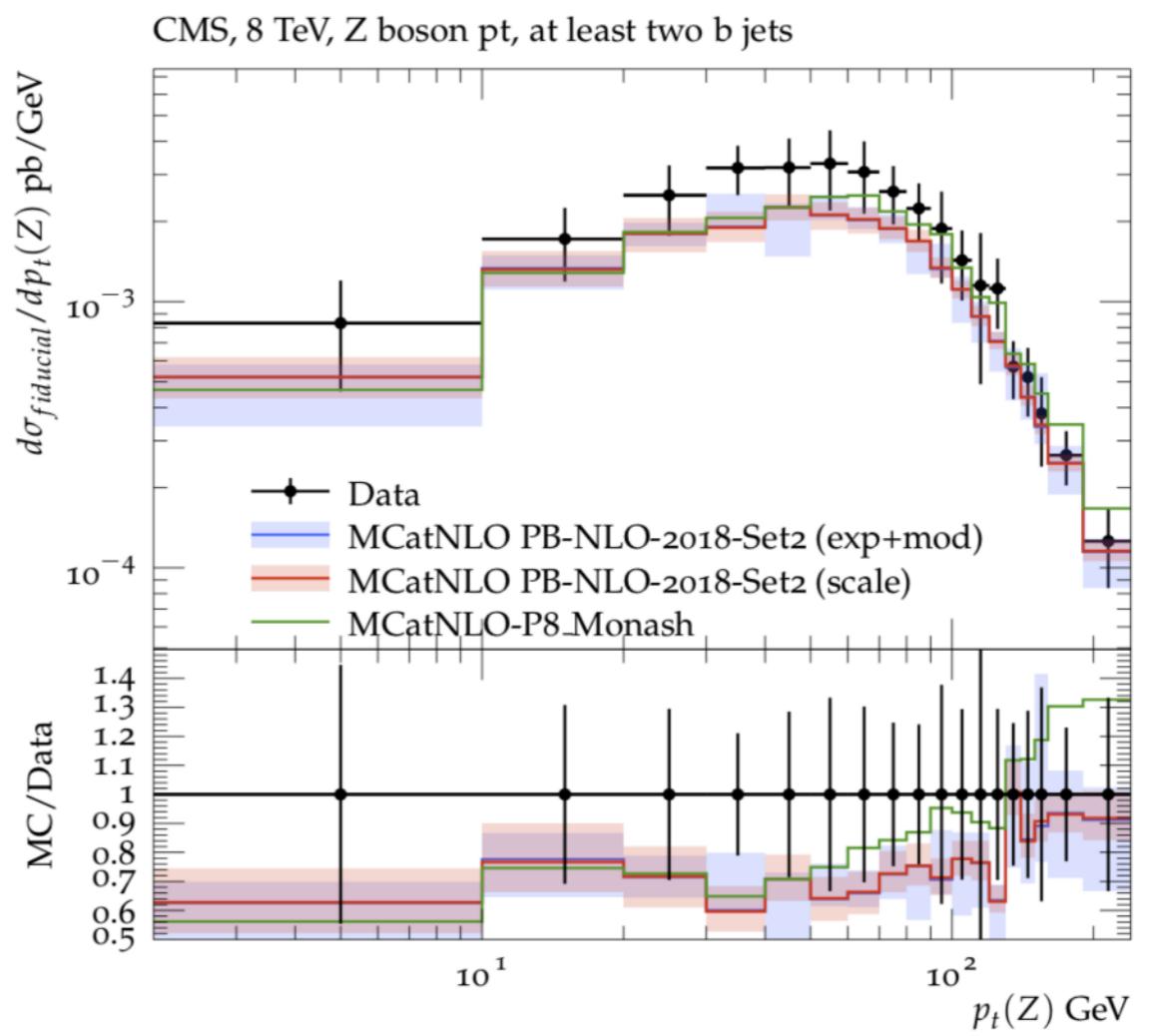
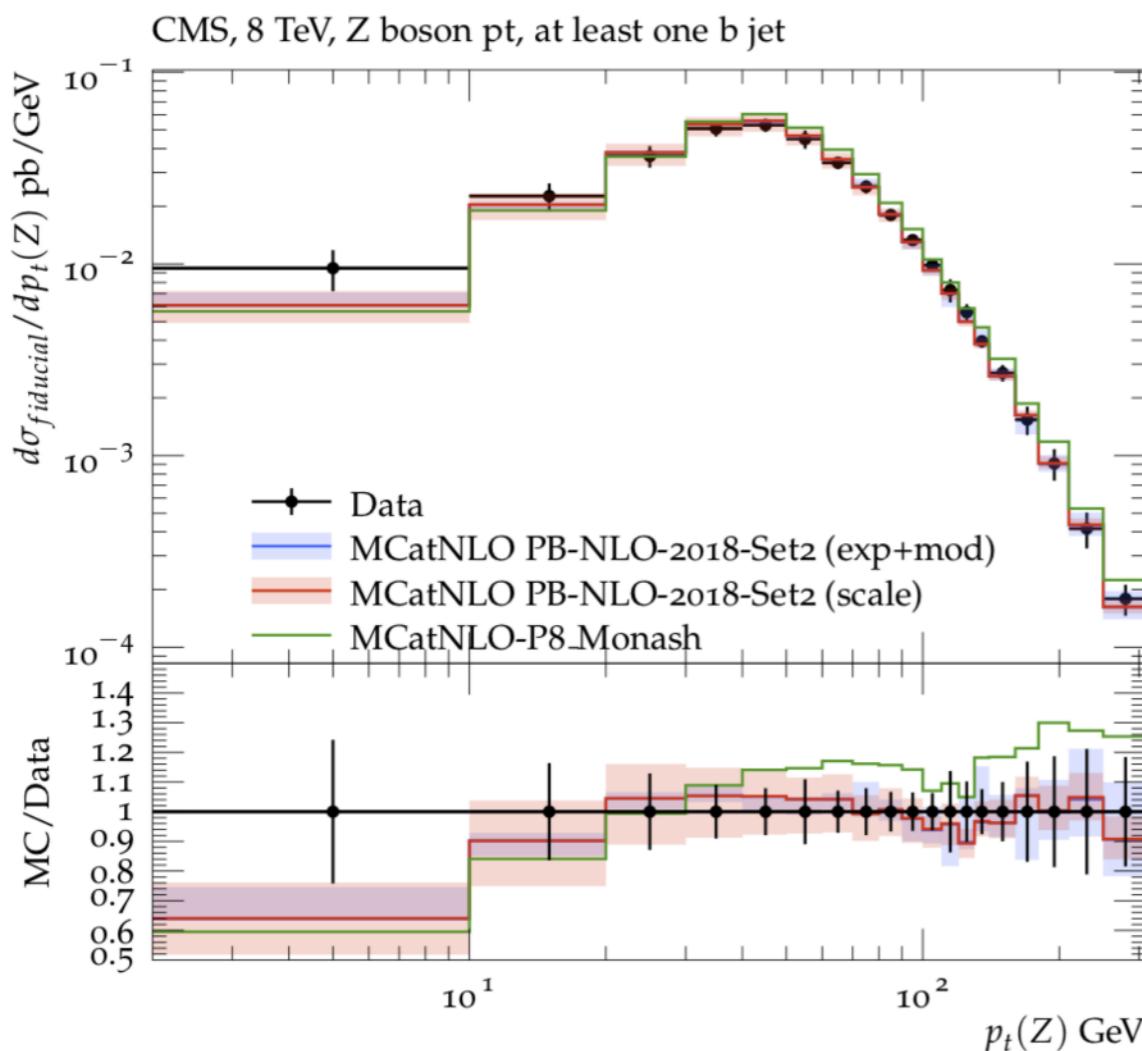
News

- CASCADE 3.0.2-beta02 released:
 - `/afs/desy.de/user/j/jung/scratch-dust/cvs/cascade3/cascade-3.0.2-beta02.tar.gz`
 - final state PS improved (making use of PYTHIA tools):
 - FPS for $Z+j$
 - QED radiation from lepton pairs ($Z \rightarrow e^+ e^-$, $Z \rightarrow \mu^+ \mu^-$, etc.)
 - Hadronization (and tune) parameters for PYTHIA changeable in steering
- Discussion on future CASCADE development:
 - L. Loennblad recommends to build within pythia8.3 frame, not ThePEG !
 - comments ?
- TMDlib 2.0 is close to be ready, minor final tests to be done.
 - please test it then !

Highlights from LHCEW talk on PB-TMDs

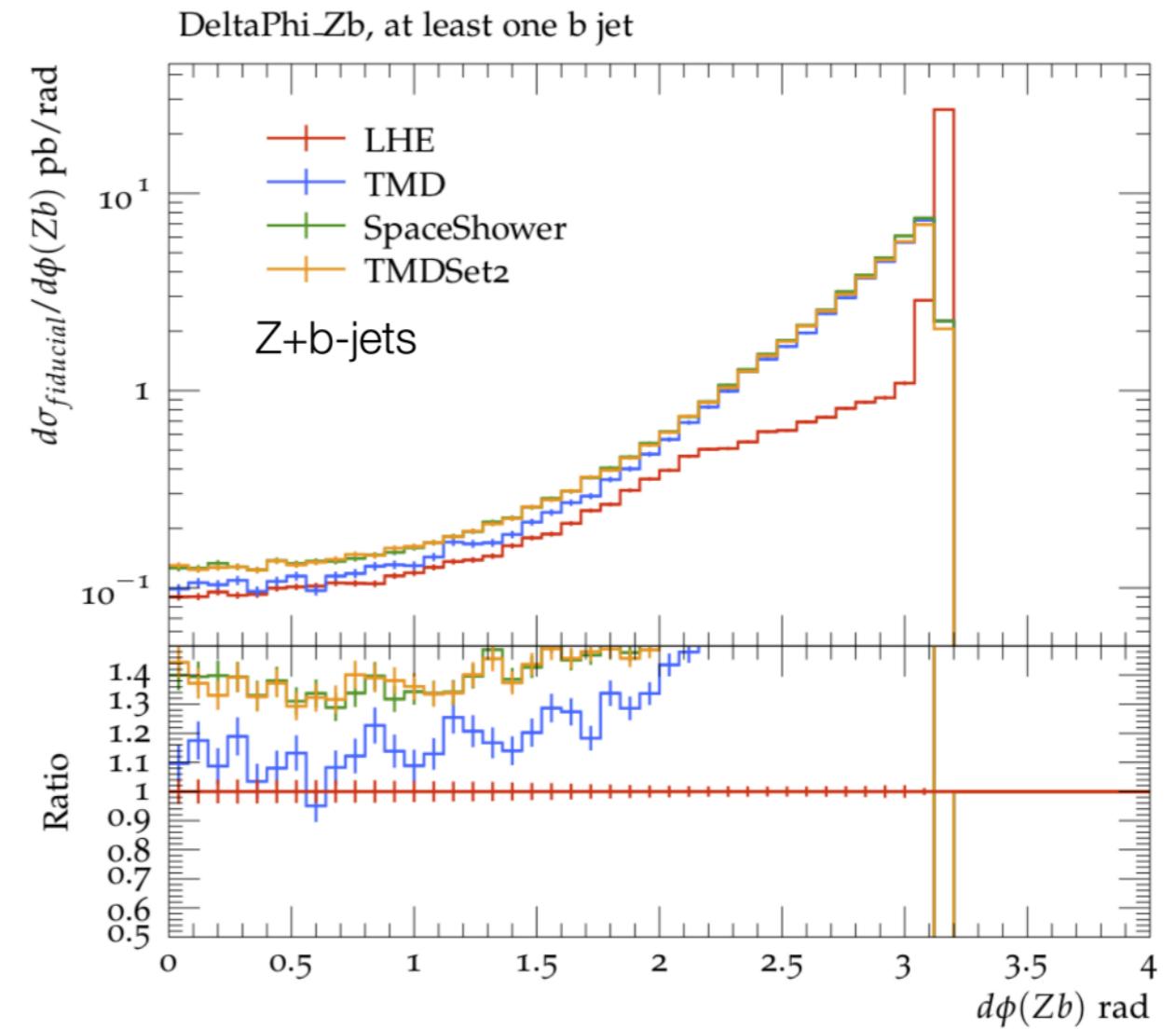
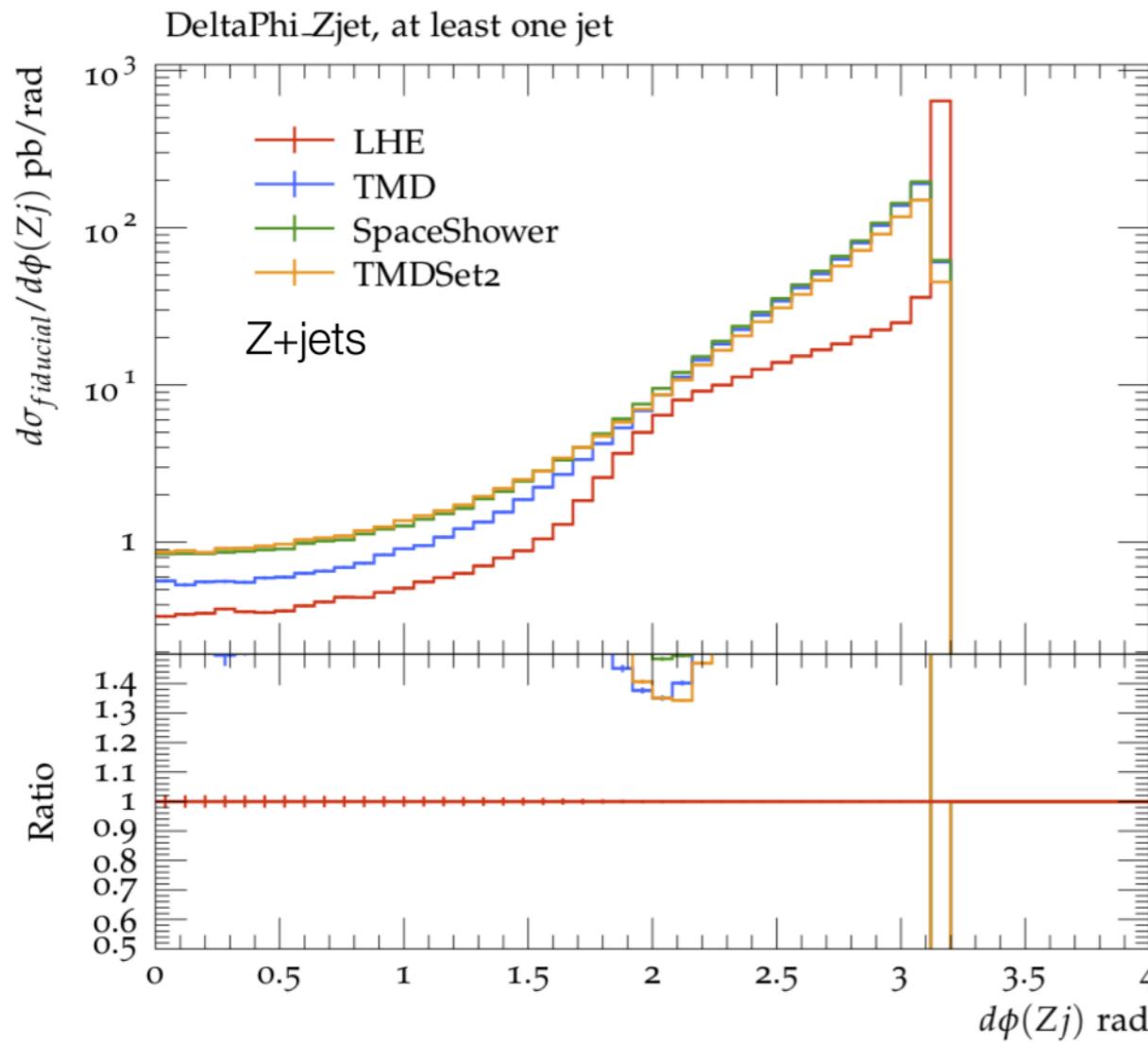
PB-TMD, PB-TMD shower & MCatNLO: $Z+b$ jets

- Cuts:
 • leptons: $|\eta| < 2.4$, $pT > 20$ GeV, $71 \text{ GeV} < m_{ll} < 111$ GeV
 • Jets: anti- k_T , R=0.5, $|\eta| < 2.4$, $pT > 30$ GeV, b-Hadron



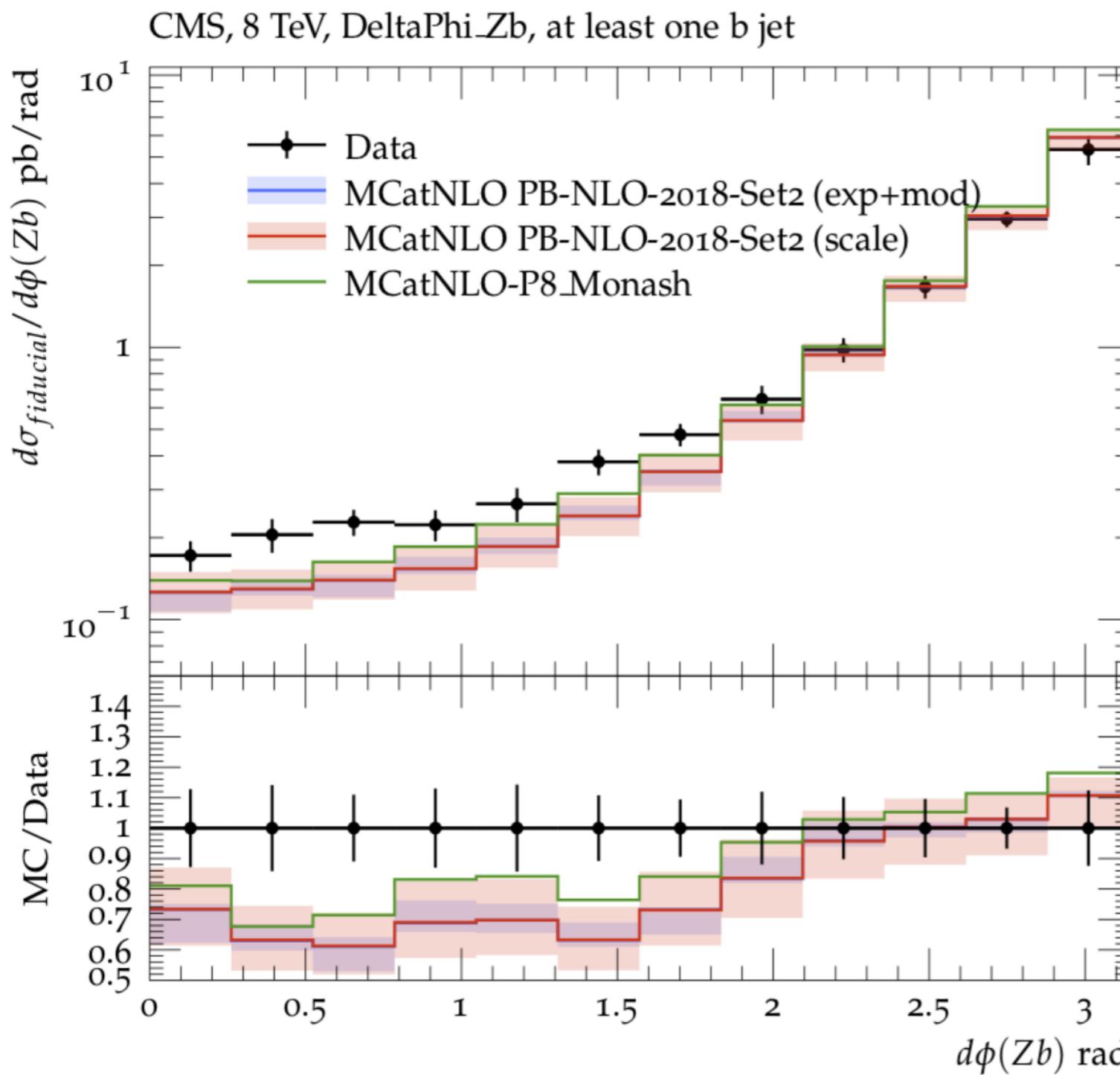
- comparison PB-TMD and P8 shower shows good agreement,
 • differences in details :)

$Z+$ jets: sensitivity to initial state k_T



- TMD important at large and small $\Delta \phi$
- initial state PS at small $\Delta \phi$
- FSR only small effect at large $\Delta \phi$
- TMD important at large $\Delta \phi$
- initial state PS only small effect (on top of TMD)
- FSR only small effect at large $\Delta \phi$

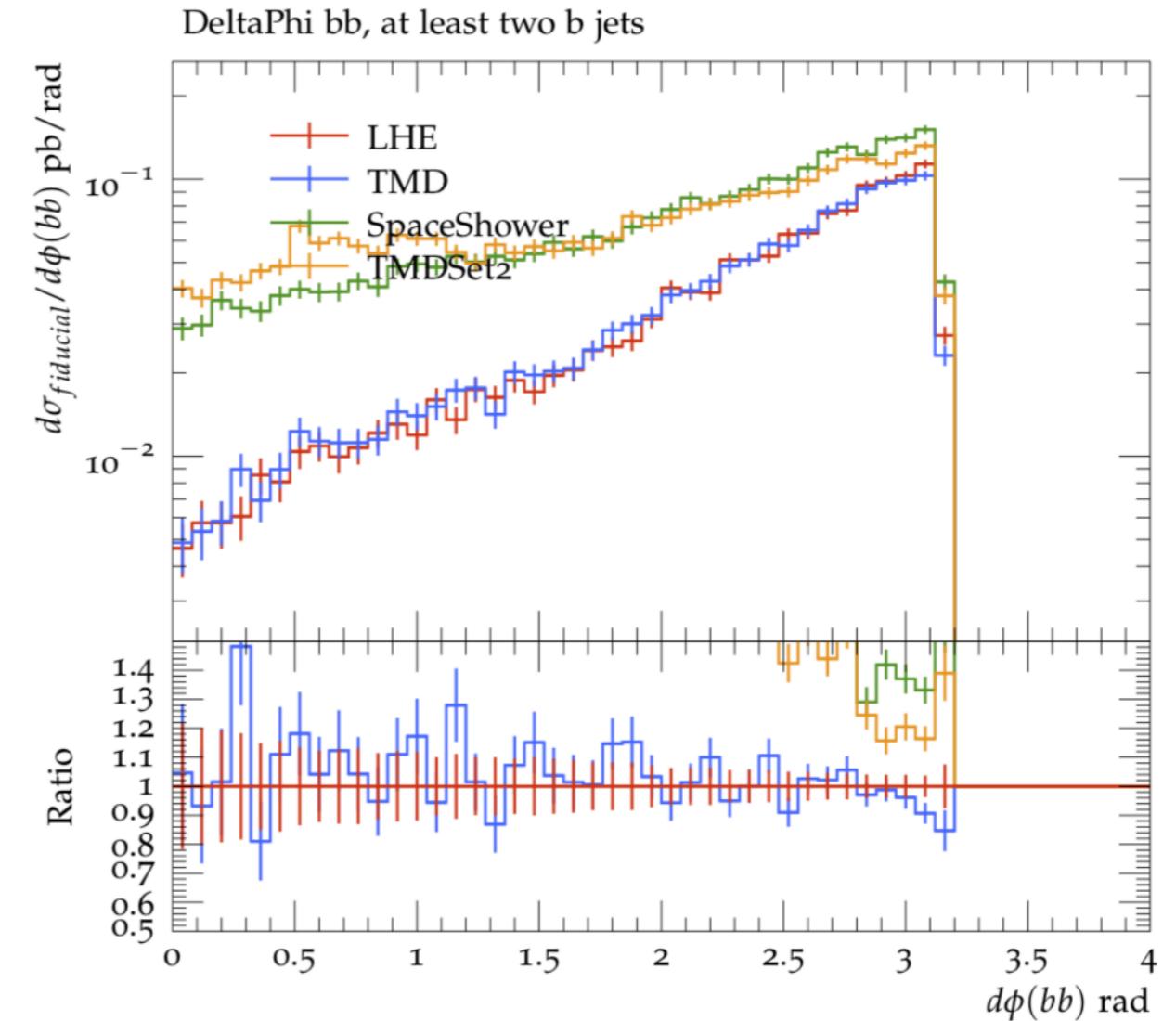
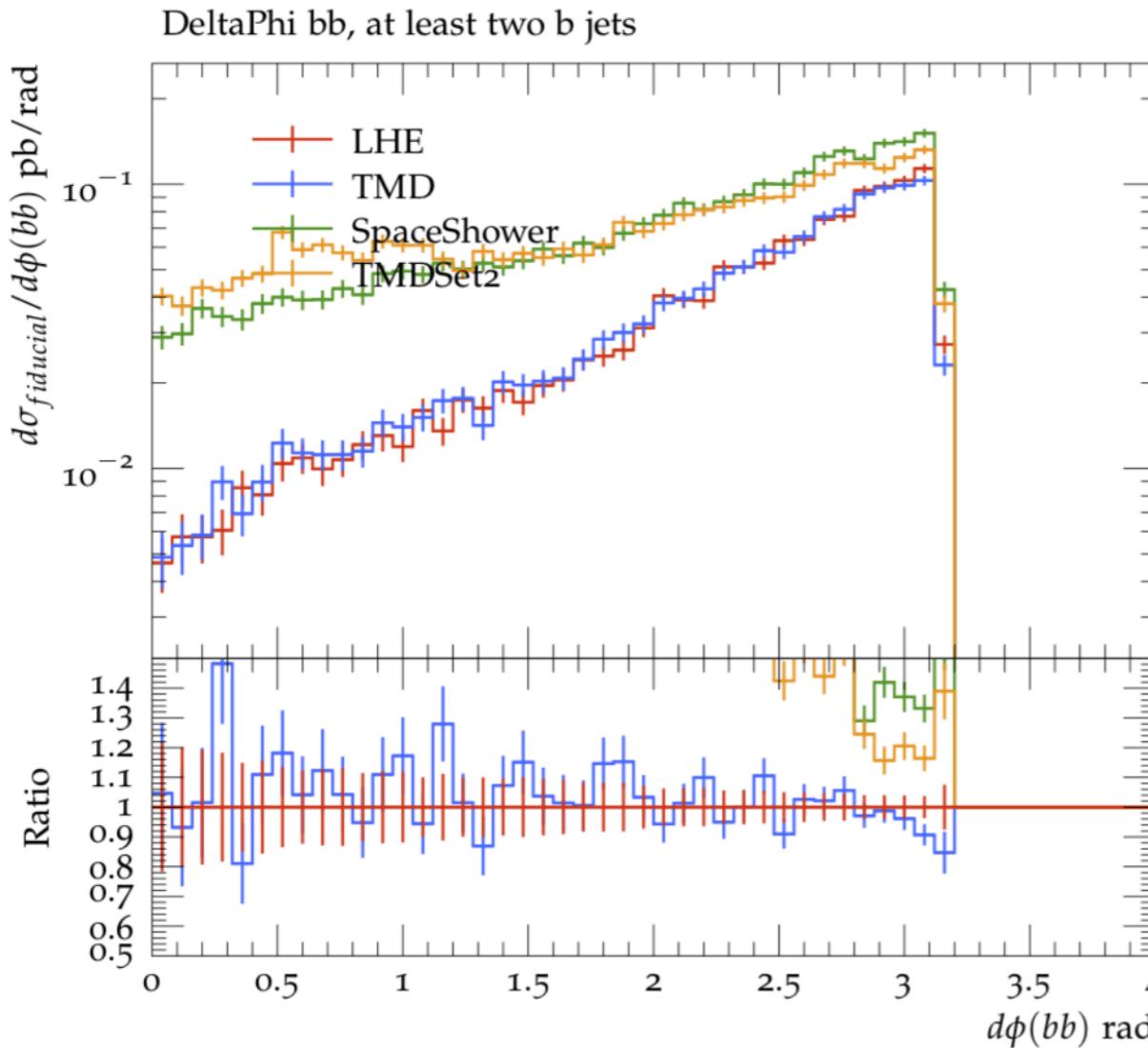
$Z+b$ -jets: $\Delta\phi(Zb)$ - comparison to measurement



- Good description in large $\Delta\phi$ region where TMD effects are relevant
 - decorrelation comes essentially from k_T from initial evolution
 - details of shower are less important (see slides before)
- distribution essentially determined by TMD distribution
- uncertainties only from TMD

→ **Z+b correlation tests TMD**

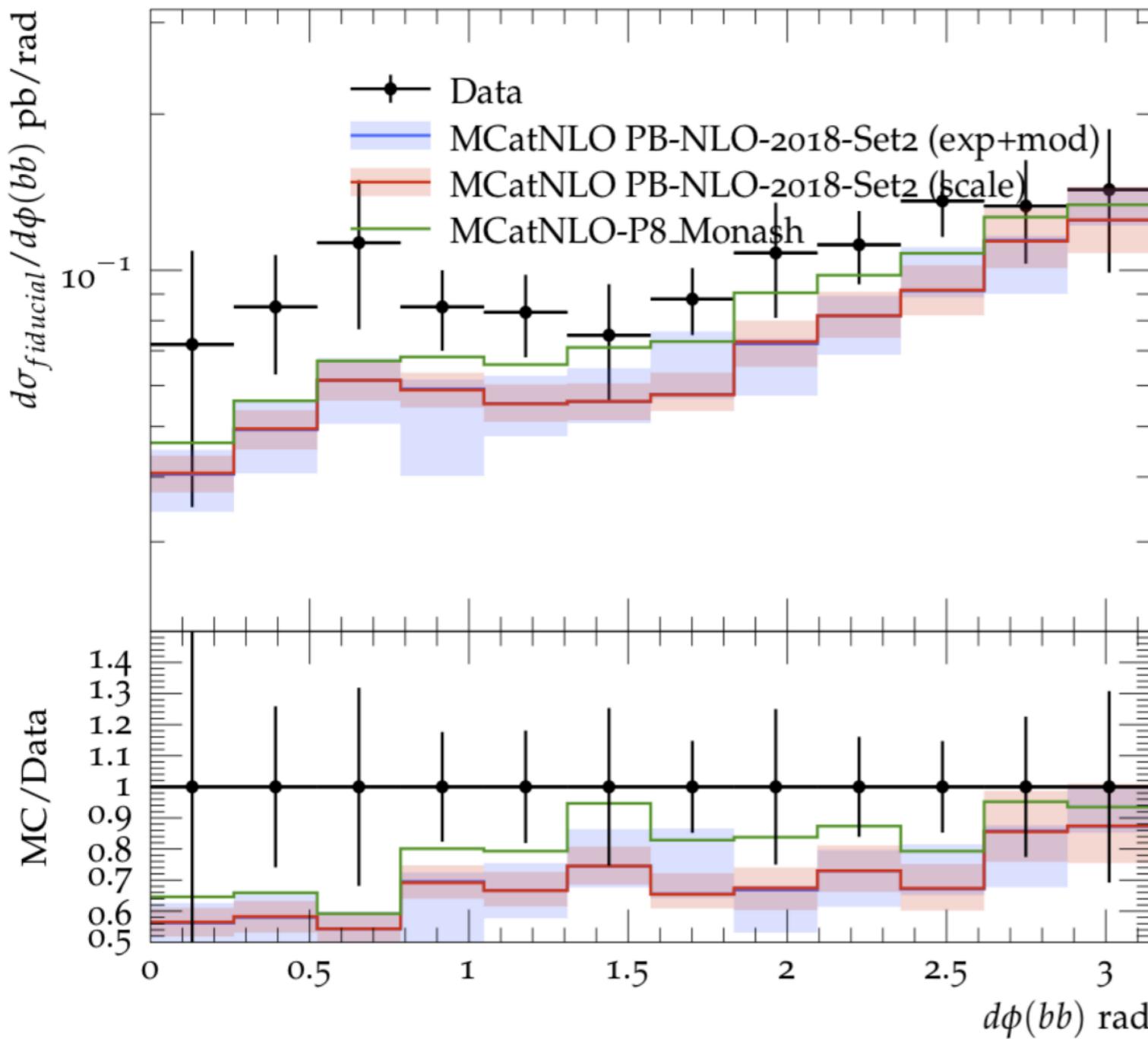
$Z + 2$ jets: sensitivity to initial state shower



- TMD has little impact
- initial state PS large small effect (on top of TMD)
- FSR significant at small $\Delta\phi : g \rightarrow bb$

Z+2b-jets: $\Delta\phi(bb)$ - comparison to measurement

CMS, 8 TeV, DeltaPhi bb, at least two b jets



- Good description
 - decorrelation comes essentially from k_T from initial evolution
 - Space shower is important
 - Time shower only at small $\Delta\phi(bb)$
 - sensitive to b-quark TMD density AND b-quark TMD-shower
- bb correlation tests space shower

Wish list from discussion

- Perform calculations in 4-flavor scheme
 - only light partons in pdf: no charm, no bottom
 - requires new TMD-PDF fits
 - requires different aMCatNLO calculations
- Vieri et al expressed interest
 - might join our PB activities

Agenda

PB TMD discussion

Thursday, 2 April 2020 from **15:30** to **17:30** (Europe/Berlin)
at **CMS meeting room**

[Manage](#)

Description Vidyo connection:
<https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=Nh6qpY4rP69Q>
If you want to join by phone, please use one of the phone numbers listed in the link below:
<http://information-technology.web.cern.ch/services/fe/howto/users-join-vidyo-meeting-phone>
and enter the meeting extension 1010403749 in order to join.

Thursday, 2 April 2020

15:30 - 15:50	Intro 20'	<input type="button" value="▼"/>
15:50 - 16:10	Issues on DGLAP/CCFM 20' Speaker: Lissa Keermaekers	<input type="button" value="▼"/>