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PHYSICS AT THE TERASCALE

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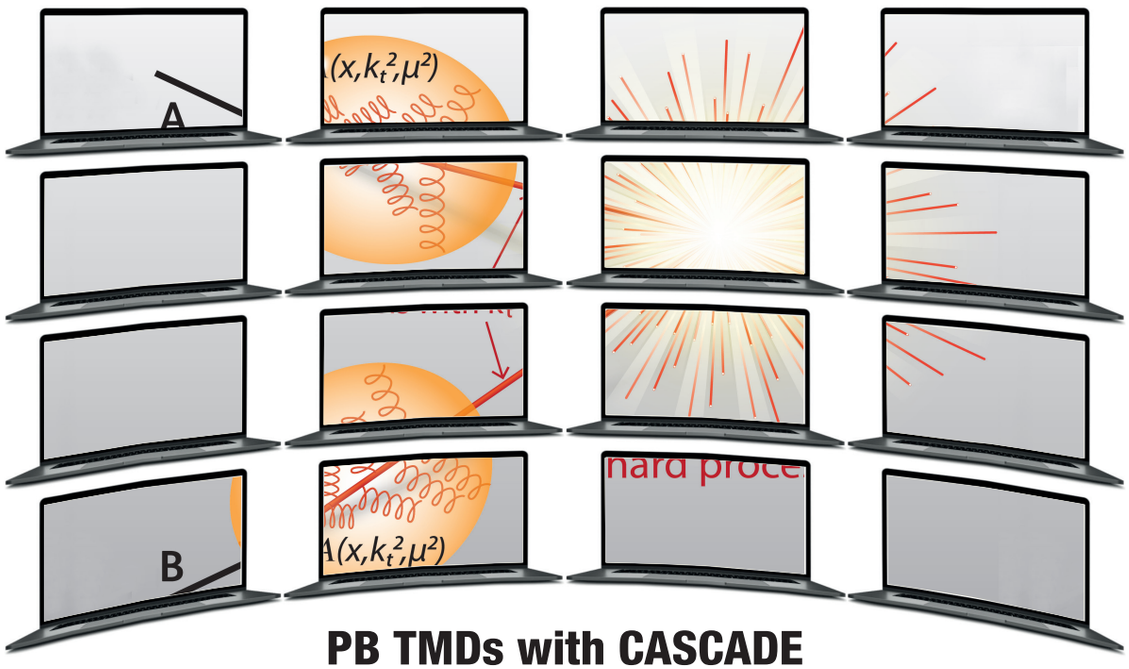
Virtual Monte-Carlo School 2021

8-12 November 2021 (on Zoom)



PB TMDs with CASCADE

Programme:

- Intro to MC techniques and Parton Shower (S. Prestel, Lund)
- Intro to Parton Branching TMDs (F. Hautmann, Oxford/Antwerp)
- Intro to CASCADE (A. Bermudez Martinez, DESY)
- Physics at future colliders (M. Mangano, CERN)

- Exercises on high pT di-jets at LHC energies
- Results of exercises will be presented at REF2021 workshop and published

Organisation Team: Armando Bermúdez Martínez (DESY), Hannes Jung (DESY), Sara Taheri Monfared (DESY), Qun Wang (DESY)

Please register on https://indico.desy.de/event/31877/

www.terascale.de/mc2021

PB TMDS with CASCADE: technical Setup

- We will run all on DESY bird cluster
- You need school account & passwd
  - get it from here
    - mark an account in the list and copy the passwd
    - no need to change passwd, they stay active over the school time

- Login to DESY machine:
  - ssh -XY schoolXX@bastion.desy.de
  - ssh -XY pal

PB TMDS with CASCADE: technical Setup

- We run everything under www directory, this allows to view files and plots on local browser.

- Login to your account
  - then do (only once)

```
mkdir www
fs setacl -dir www -acl desy-hosts read
cd www
```

  - Copy startup kit to your directory:
    - `cp -rp /afs/desy.de/user/j/jung/public/mcschool2021/cascade3 .`
    - `cd cascade3`

- Prepared Yoda files (Histogram files) are linked with YodaFile dir
  - `ls -l YodaFiles/*`

PB TMDS with CASCADE: technical Setup

- We are using the Rivet package for analyzing MC output, comparing with measurements and plotting

- Produce you first plots with rivet:

```
cd cascade3
source setup.sh
rivet-mkhtml --mc-errs -o PB-fNLO YodaFiles/cascade3.1.1-13TeV-
aMCatNLO-jj-lhescale2-Onshell=1-QED=0-Had=1-TimeShower=1-TimeS=4-
scaleFS=1-SpaceShower=1-
Iqlu=102200unc_merged.yoda:"MCatNLO+CAS3:BandComponentEnv=MUR.*MUF.*:E
rrorBandOpacity=0.3" YodaFiles/cascade3.1.1-13TeV-aMCatNLO-jj-fNLO_
merged.yoda:"fNLO:BandComponentEnv=MUR.*MUF.*:ErrorBandOpacity=0.3"
```

  - or just look on README.plot and copy the line from there

PB TMDS with CASCADE: technical Setup

- The rivet commands for plotting can be found here.

- Look at the plots under PB-yy with a browser and try to understand what is plotted.
  - open a browser window and go to: https://www.desy.de/~schoolXX/ where schoolXX is your school account,
    - look for cascade3/PB-yy

- CASCADE webpage
  - manual
  - and installation instructions
- also have a look at TMDplotter: http://tmdplotter.desy.de
- and the TMDlib webpage and the manual