

Cascade developer meeting

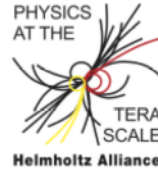
- Hope that you are all ok !
- Thousand thanks for all contributing to the first PB - TMD school.

PB TMD with CASCADE - Monte Carlo school

Helmholtz Alliance

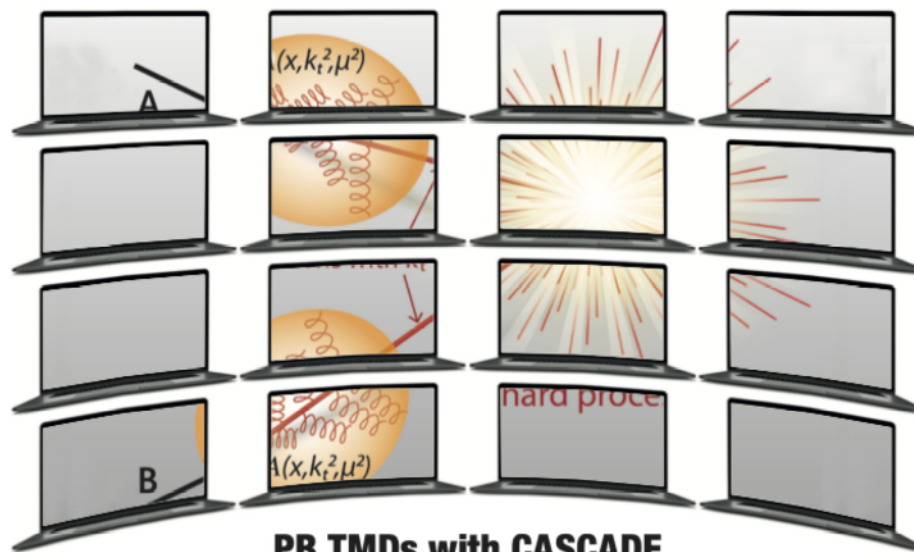
PHYSICS AT THE TERASCALE

Deutsches Elektronen-Synchrotron DESY +++ Karlsruher Institut für Technologie - Großforschungsbereich +++ Max-Planck-Institut für Physik +++ Rheinisch-Westfälische Technische Hochschule Aachen
+++ Humboldt-Universität zu Berlin +++ Rheinische Friedrich-Wilhelms-Universität Bonn +++ Technische Universität Dortmund +++ Technische Universität Dresden +++ Albert-Ludwigs-Universität
Freiburg +++ Justus-Liebig-Universität Gießen +++ Georg-August-Universität Göttingen +++ Universität Hamburg +++ Ruprecht-Karls-Universität Heidelberg +++ Karlsruher Institut für
Technologie - Universitätsbereich +++ Johannes Gutenberg-Universität Mainz +++ Ludwig-Maximilians-Universität München +++ Universität Regensburg +++ Universität Rostock +++ Universität
Siegen +++ Julius-Maximilians-Universität Würzburg +++ Bergische Universität Wuppertal +++



Virtual Monte-Carlo School 2021

8-12 November 2021 (on Zoom)



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 p_T 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

- MC school: PB TMDs with CASCADE
 - very positive resonance
 - > 60 registrants
 - > 20 in HandsOn Exercises
- studies on high p_T dijet production
 - presented at REF 2021 by Qun
 - multijet merging presented by Armando

PB TMD with CASCADE - Monte Carlo school

Terascale Monte Carlo School: PB TMDs with CASCADE

from Monday, 8 November 2021 (08:00) to Friday, 12 November 2021 (18:00)

Monday, 8 November 2021	Tuesday, 9 November 2021	Wednesday, 10 November 2021	Thursday, 11 November 2021	Friday, 12 November 2021
		11:00 Lecture: Intro to PB TMDs - Francesco Hautmann (Oxford/Antwerpen)		
13:00 Welcome - Hannes Jung (DESY)	13:00 Lecture: Intro to PB TMDs (po...	13:00 Exercises on Dijets at LHC	13:00 Exercises on Dijets at LHC	13:00 Summary - preparation of
13:05 Lecture: Intro to Monte Carlo - Stefan Prestel (DESY)	13:10 Technical setup			contribution
	14:00 Introduction to CASCADE - Armando Bermudez Martinez (CMS (CMS Fachgruppe QCD))			
15:00 Technical setup	15:00 PB TMDs - Hannes Jung (DESY)			15:00 Multijet merging
			16:00 Physics at future colliders - Michelangelo Mangano (CERN)	
			17:30 Science bridging Cultures and Nations (Science & Society Science4Peace seminar) - Rolf Heuer (CERN)	

Thanks a lot, Stefan, Francesco,
Armando, Michelangelo for the very
nice lectures !

All slides and recordings are on indico

PB TMD with CASCADE - Monte Carlo school

- Exercises:
 - general intros, then breakout rooms
 - practical HandsOn exercises on DESY naf
 - results from exercises are uploaded on CERNbox
<https://cernbox.cern.ch/index.php/s/WXz6YEMIC71tzSV>
 - passwd: cascade
 - 7 participants uploaded their results for checks
- Results from the MC school are now put into a paper draft, and should be published:
 - Goal is to present jet studies with PB – TMDs and to discuss region, where TMDs are important.
 - Will discuss paper draft later !
 - Everybody who participated in the school and is interested can join as author
 - Want to send it to participants on weekend !

What is our global picture ?

- PB TMDs + TMD shower with NLO calculation gives very good description of dijet angular correlations
 - uncertainties in calculation are dominated from scale uncertainties, TMD uncertainties are very small
 - dijet azimuthal correlations are dominated by TMD and TimeShower
 - 3jet and 4jet correlations are sensitive to SpaceShower from TMDs
- PB TMDs + ... with off-shell ME agree with NLO calculation
- Comparison with other approaches - P8,

CASCADE – new developments

- Pending:
 - HepMC3 integration
- Publication on Z+jet (and comparison with multijet)
- Final state TMD shower ala Parton Branching
 - cooperate with Tehran group
- AOB ?