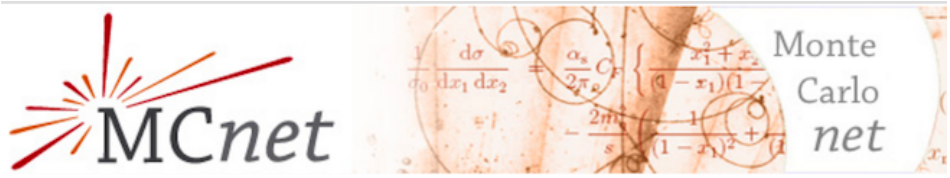
18th MCnet Meeting and MCnetITN3 Mid-Term Review



Report of Contributions

https://agenda.irmp.ucl.ac.be/e/3217

Contribution ID: **25** Type: **not specified**

Four-jet DPS production in pp and pA collisions within the Pythia's framework

Friday, 25 January 2019 09:00 (20 minutes)

In spite of the recent progress in both theoretical and experimental studies many aspects of *multiple parton interactions* (MPI) still require a detail investigation. In particular, *double parton scattering* (DPS) processes can play a dominant role for some specific kinematic regions of multi-jet production, especially in *proton-nucleus* (pA) collisions where the total DPS cross section is approximately 3A times bigger as the corresponding total DPS cross section in *proton-proton* (pp) collisions.

In this talk I will present results I have got during the work on my MCNet short-term project, in particular I will consider two different ways to model *double parton distribution functions*, namely double DGLAP evolution equations and MPI formalism of the Pythia event generator, present a quantitative study of differences and similarities between both approaches and discuss their impact on various DPS sensitive differential distributions. Additionally I will compare predictions of a Pythia's built-in model of pA collisions (Angantyr) against theoretical computations currently available in the literature and show that it demonstrates a correct dependence of a total DPS cross section on a total number of nucleons.

Summary

Primary authors: FEDKEVYCH, Oleh (Lund University); Dr BELLM, Johannes; Dr GAUNT, Jonathan (CERN); Prof. KULESZA, Anna (University of Münster); Prof. LÖNNBLAD, Leif; Prof. SJÖSTRAND, Torbjörn

Presenter: FEDKEVYCH, Oleh (Lund University)

Session Classification: Network meeting

Contribution ID: **26** Type: **not specified**

Recursive Matrix-Element Corrections in the Vincia Helicity Shower

Friday, 25 January 2019 09:40 (20 minutes)

The Vincia antenna shower is a plugin to Pythia which allows for multiple matrix-element corrections (MECs), as well as systematic shower uncertainty estimates. In this talk I will discuss the former, with a particular emphasis on how we used maximally-helicity-violating (MHV) amplitudes for the MECs. Finally, I will show a new ATLAS result for gluon splitting to b quarks which appears to prefer Vincia's ME-corrected shower to the standard event generators.

Summary

Primary author: LIFSON, Andrew (Lund University)

Co-authors: SKANDS, Peter (Monash University); FISCHER, Nadine

Presenter: LIFSON, Andrew (Lund University)

Session Classification: Network meeting

Contribution ID: **27** Type: **not specified**

Hard diffraction in photoproduction

Wednesday, 23 January 2019 11:00 (20 minutes)

We present a new framework for modeling hard diffractive events in photoproduction, implemented in Pythia 8.

Summary

Primary authors: RASMUSSEN, Christine; HELENIUS, Ilkka

Presenter: RASMUSSEN, Christine

Session Classification: Network meeting

Contribution ID: **28** Type: **not specified**

SingularPhasespace event generator

Friday, 25 January 2019 11:00 (20 minutes)

I present SingularPhasepace, a new hard process event generator soon to be implemented in Herwig. It will generate events that push steadily into a singular limit, whilst keeping as much fixed as possible. This will make it easier to test and validate Herwig‘s use of Matrix Elements and the Dipole Subtraction algorithm.

Summary

Primary author: Mr OSTROLENK, Kiran

Co-authors: Mr PLÄTZER, Simon; Mr SEYMOUR, Michael

Presenter: Mr OSTROLENK, Kiran

Session Classification: Network meeting

Contribution ID: **29** Type: **not specified**

A Parton-Level Simulation of Double Parton Scattering

Friday, 25 January 2019 09:20 (20 minutes)

Multiple parton interactions and, more specifically, double parton scattering are usually suppressed by single parton scattering. However, in some specific regions of phase-space, the differential cross sections are comparable. Also, for a given final state, it might happen that the double parton scattering is the dominant contribution if the single parton scattering is suppressed by a higher multiplicity of couplings. For these reasons, it turns out to be necessary to include double parton scattering in event generators in order to give a better description of the data at high energy scales such as at the LHC. The description of double parton scattering requires the use of double parton distributions and many efforts have been made during the last decade to produce realistic sets of those distributions, despite the lack of experimental data. In this presentation, we introduce a parton-level simulation of double parton scattering that combines a set of double parton distributions and an angular-ordered parton shower.

Summary

Primary author: CABOUAT, Baptiste (University of Manchester)

Presenter: CABOUAT, Baptiste (University of Manchester)

Session Classification: Network meeting

Contribution ID: **30** Type: **not specified**

Bounding the Higgs width through interference effects

Friday, 25 January 2019 11:40 (20 minutes)

I review an ongoing pheno study, in which my collaborators and I explore if the experimental bounds on the Higgs decay width could potentially be improved by exploiting interference effects of the $pp \to H \to \gamma\gamma$ signal with the $pp \to \gamma\gamma$ continuum background. We use particle-level simulated data using SHERPA and a complete likelihood analysis to derive the expected bound, and thus go beyond earlier findings where approximate bounds were derived using fixed-order predictions [Dixon, Li 1305.3854 (2013)].

Summary

Primary authors: BOTHMANN, Enrico (ITP Göttingen); KUTTIMALAI, Silvan (SLAC); HÖCHE, Stefan (SLAC); DIXON, Lance (SLAC)

Presenter: BOTHMANN, Enrico (ITP Göttingen)

Session Classification: Network meeting

Contribution ID: **31** Type: **not specified**

Multiple emission kernels for parton showers

Friday, 25 January 2019 10:00 (20 minutes)

The future of parton showers is centered around increasing the accuracy and comparison to data especially as higher precision and higher orders become more important. In this talk I will present my work on the determination of emission kernels, focusing on the two emission case, and some of the necessary steps involved in the process.

Summary

Primary author: SIMPSON DORE, Emma (KIT)

Presenter: SIMPSON DORE, Emma (KIT)

Session Classification: Network meeting

Contribution ID: **32** Type: **not specified**

Top-quark effects in diphoton production through gluon fusion at NLO in QCD

Friday, 25 January 2019 11:20 (20 minutes)

We calculated the NLO QCD corrections to diphoton production through gluon fusion at the LHC, including both light quarks and the top quark. The two-loop amplitudes involving the top quark loop are evaluated through numerical methods proposed recently. We found that NLO QCD corrections are large, and the inclusion of top quark affects the results dramatically.

Summary

Primary authors: ZHAO, Xiaoran (CP3); MALTONI, Fabio (UCL); MANDAL, Manoj Kumar (APCTP, Korea)

Presenter: ZHAO, Xiaoran (CP3)

Session Classification: Network meeting

Contribution ID: **33** Type: **not specified**

Tuning of Merged Pythia

Wednesday, 23 January 2019 11:40 (20 minutes)

Monte Carlo Event Generators are important tools to understand the physics of particle colliders. Due to the complexity of particle collisions and the limited ability of perturbative QCD to describe the low energy behavior of partons, we need phenomenological models to provide a complete prediction of many observables. A systematic tuning of model parameters based on experimental data allows us to optimize the predictions of Monte Carlo Event Generators and refine our understanding the relevant models.

In this talk, I give an overview about tuning and discuss recent efforts of tuning Pythia in the context of matching and merging. Furthermore, I present AutoTunes, a framework for the simultaneous tuning of many parameters with automated weight setting.

Summary

Primary author: GELLERSEN, Leif (Lund University)

Presenter: GELLERSEN, Leif (Lund University)

Session Classification: Network meeting

Contribution ID: **34** Type: **not specified**

Short-term internship at B12 consulting

Wednesday, 23 January 2019 12:00 (20 minutes)

A report of my experience at the consulting company B12 in the MCnet program for non-academic secondments.

Summary

Primary author: Mr MANTANI, Luca

Presenter: Mr MANTANI, Luca

Session Classification: Network meeting

Contribution ID: **35** Type: **not specified**

String shoving in Heavy ions: Few ideas

Wednesday, 23 January 2019 11:20 (20 minutes)

We introduce a symmetric frame to study the interactions of a system of two strings for the string shoving mechanism within the Lund model. Considering all such pairs of string pieces in a collision, the resulting total momentum change on all such string pieces will be calculated.

Summary

Primary author: Ms CHAKRABORTY, Smita (Lund University)

Co-authors: Dr BIERLICH, Christian; Prof. GUSTAFSSON, Gosta; Prof. LÖNNBLAD, Leif

Presenter: Ms CHAKRABORTY, Smita (Lund University)

Session Classification: Network meeting

Contribution ID: **36** Type: **not specified**

Studies of SM Monte Carlo and particle-level measurements in constraining new physics

Friday, 25 January 2019 12:00 (20 minutes)

As a joint task between MCnet and ATLAS, I will present the results of vector boson production in association with jets in the Herwig7 event generator, with multi-jet merging at next-to-leading order (NLO) accuracy. Next I introduce the idea of unfolding a detector level measurement and the ATLAS 4-lepton analysis. Finally, I will discuss how precision Monte Carlo predictions can be used alongside detector-corrected experimental data to set limits on new physics models in tools such as CONTUR.

Summary

Primary author: HUANG, Danping Joanna

Presenter: HUANG, Danping Joanna

Session Classification: Network meeting

Contribution ID: **38** Type: **not specified**

Mid-Term Meeting, MCnetITN3

Thursday, 24 January 2019 09:00 (15 minutes)

Session Classification: Mid-Term Review

Contribution ID: **39** Type: **not specified**

MCnetITN3 MTR Tour de Table

Thursday, 24 January 2019 09:15 (30 minutes)

Session Classification: Mid-Term Review

Contribution ID: **40** Type: **not specified**

Coordinator's Report - Scientific

Thursday, 24 January 2019 09:45 (15 minutes)

Session Classification: Mid-Term Review

Contribution ID: **41** Type: **not specified**

Coordinator's Report - Training

Thursday, 24 January 2019 10:00 (15 minutes)

Session Classification: Mid-Term Review

Contribution ID: **42** Type: **not specified**

Coordinator's Report: Management & Networking

Thursday, 24 January 2019 10:15 (15 minutes)

Session Classification: Mid-Term Review