

17th MCnet Meeting

Tuesday 10 April 2018 - Thursday 12 April 2018

CERN



Book of Abstracts

Contents

ALICE feedback	1
ATLAS	1
ATLAS feedback	1
Alice	1
B12	1
Blue Yonder	1
CEDAR overview	1
CLIC/ILC - linear e+e- machines	2
CMS	2
CMS feedback	2
Cedar	2
Creating heavy ion events from pp events in a generator independent way	2
Diffraction in Pythia	3
Double Parton Distributions and Parton Showers	3
Exploring azimuthal correlations in multijet events	3
HEJ: The Path to NLL	3
Heavy Ion analysis & MC discussion	4
Herwig	4
IBA	4
Implementing QED radiation in Vincia	4
Introduction	4
Introduction	5
Introduction	5

Introduction	5
Introduction	5
LHCb	5
LHCb feedback	5
MadDM v.3.0	6
Madgraph	6
Plugin/HEJ	6
Pythia	6
Recasting: Contur	6
Recasting: logistics, standards, data flow,	6
Secondary absorptive interactions in the Angantyr model	7
Sherpa	7
d-fine	7

MCnet Individual Project Meetings / 49

ALICE feedback

Corresponding Author(s): przemyslaw.karczmarczyk@cern.ch

Open Session with LHC Experiments - including status reports of MCnet projects/generators / 24

ATLAS

Corresponding Author(s): mcfayden@cern.ch

MCnet Individual Project Meetings / 46

ATLAS feedback

Corresponding Author(s): chris.g@cern.ch

Open Session with LHC Experiments - including status reports of MCnet projects/generators / 22

Alice

Corresponding Author(s): redmer.alexander.bertens@cern.ch

MCnet Industry Partners' Talks and discussion of secondment projects / 43

B12

MCnet Industry Partners' Talks and discussion of secondment projects / 41

Blue Yonder

MCnet Individual Project Meetings / 52

CEDAR overview

Corresponding Author(s): j.butterworth@cern.ch, a.g.buckley@gmail.com

Open Session with LHC Experiments - including status reports of MCnet projects/generators (continued) / 28

CLIC/ILC - linear e+e- machines

Corresponding Author(s): ulrike.schnoor@cern.ch

Open Session with LHC Experiments - including status reports of MCnet projects/generators / 20

CMS

Corresponding Author(s): kdlong@wisc.edu

MCnet Individual Project Meetings / 47

CMS feedback

Corresponding Author(s): markus.seidel@cern.ch, xavier.janssen@cern.ch

Open Session with LHC Experiments - including status reports of MCnet projects/generators (continued) / 29

Cedar

Corresponding Author(s): a.g.buckley@gmail.com, j.butterworth@cern.ch

Student Talks 2 / 34

Creating heavy ion events from pp events in a generator independent way

Christian Bierlich¹ ; Johannes Bellm²

¹ *Lund University (SE)*

² *Lund*

Corresponding Author(s): johannes.bellm@thep.lu.se, christian.bierlich@thep.lu.se

The Pythia event generator has seen a lot of progress relating to modeling heavy ion collisions, in the parton-level stacking framework known as Angantyr. Several of the ideas behind Angantyr are, however, not local to Pythia, and it is therefore possible to implement them in a generator independent way.

We present the initial version of such an implementation, which essentially allows for input from all three main generators. As this has been suggested as a topic for this years MCnet summer school tutorials, we show some suggestions to how such a tutorial can be organized, and invite for discussion.

Student Talks 2 / 32**Diffraction in Pythia**Christine Rasmussen^{None}

Update on ongoing activities in Pythia.

Student Talks 3 / 44**Double Parton Distributions and Parton Showers**Baptiste Cabouat¹¹ *University of Manchester***Corresponding Author(s):** baptiste.cabouat@manchester.ac.uk

Double parton scattering is 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.

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 work, we explore some directions to include those double parton distributions within the conventional partons showers.

Student Talks 3 / 54**Exploring azimuthal correlations in multijet events**Armando Bermudez Martinez¹¹ *CMS-DESY***Corresponding Author(s):** armando.bermudez.martinez@cern.ch

Following the recent measurements I did within the CMS collaboration I will bring up some still remaining open issues in closely back-to-back dijet topologies in 2- and 3-jet inclusive events. There are considerable differences observed (up to 15%) and 2- and 3-jet data is not described by any of the models considered simultaneously. Also the unexpected behavior of Madgraph interfaced with Pythia8 will be address for 4-jet inclusive topologies. Preliminary studies suggesting a not proper merging as the source of the differences will be presented. An outlook and prospects on an exhaustive phenomenological investigation to address these issues within the Lund MCnet node will also be given.

Student Talks 3 / 35**HEJ: The Path to NLL**James Black¹

¹ *IPPP*

Corresponding Author(s): james.a.black@durham.ac.uk

Presenting the first set of LL corrections to sub-leading processes within W+Jets in HEJ. This adds resummation to many processes previously only matched to FO.

MCnet Individual Project Meetings / 50

Heavy Ion analysis & MC discussion

Corresponding Author(s): leif.lonnblad@thep.lu.se, christian.bierlich@thep.lu.se

Open Session with LHC Experiments - including status reports of MCnet projects/generators / 21

Herwig

Corresponding Author(s): johannes.bellm@thep.lu.se

MCnet Industry Partners' Talks and discussion of secondment projects / 40

IBA

Student Talks 3 / 31

Implementing QED radiation in Vincia

Rob Verheyen¹

¹ *Radboud University Nijmegen*

Corresponding Author(s): robverheyen@gmail.com

Most parton showers currently work in the leading colour limit, allowing for coherent gluonic radiation through either angular ordering or the dipole/antenna formalism. For photon emission, the equivalent type of radiation in QED, there is no leading colour limit and the soft structure is more complicated. In this talk, I will discuss how we are including photonic emissions into the Vincia parton shower. I will briefly explain several available algorithms which have varying accuracy and speed.

Student Talks 1 / 56

Introduction

Student Talks 1 / 55

Introduction

Student Talks 2 / 33

Introduction

Leif Gellersen¹

¹ *Lund University*

Corresponding Author(s): leif.gellersen@thep.lu.se

A short introduction about myself as a new PhD student at Lund University.

Student Talks 2 / 30

Introduction

Smita Chakraborty¹

¹ *Lund University*

Corresponding Author(s): smita.chakraborty@thep.lu.se

Introduction as a new MCnet Ph.D. student at LU and short description of the first research project

MCnet Industry Partners' Talks and discussion of secondment projects / 39

Introduction

Open Session with LHC Experiments - including status reports of MCnet projects/generators (continued) / 26

LHCb

Corresponding Author(s): philten@cern.ch

MCnet Individual Project Meetings / 48

LHCb feedback

Corresponding Author(s): alex.grecu@cern.ch, gloria.corti@cern.ch

Student Talks 1 / 45**MadDM v.3.0**Federico Ambrogio¹¹ *CP3 Centre for Cosmology, Particle Physics and Phenomenology***Corresponding Author(s):** federico.ambrogio@cern.ch

We present the recently published MadDM v.3.0, now a plugin of Madgraph5_aMC@NLO. The new release extends the capabilities of the previous versions with a dedicated module for dark matter indirect detection. MadDM is now able to generate energy spectra from dark matter annihilation, calculate cosmic rays fluxes and compare the theory predictions with the Fermi-LAT upper limits from the observation of dwarfs galaxies gamma rays. Moreover the new 'scan mode' functionality makes it easy to sample the parameter space of the user's dark matter model.

Open Session with LHC Experiments - including status reports of MCnet projects/generators / 23**Madgraph****Corresponding Author(s):** olivier.mattelaer@uclouvain.be**Open Session with LHC Experiments - including status reports of MCnet projects/generators (continued) / 27****Plugin/HEJ****Corresponding Author(s):** marian.heil@durham.ac.uk, jeppe.rosenkrantz.andersen@cern.ch**Open Session with LHC Experiments - including status reports of MCnet projects/generators / 25****Pythia****Corresponding Author(s):** leif.lonnblad@thep.lu.se**MCnet Individual Project Meetings / 51****Recasting: Contur****Corresponding Author(s):** j.butterworth@cern.ch, david.yallup.15@ucl.ac.uk**MCnet Individual Project Meetings / 53**

Recasting: logistics, standards, data flow, ...

Corresponding Author(s): zach.marshall@cern.ch, a.g.buckley@gmail.com, lukas.heinrich@cern.ch

Student Talks 2 / 36

Secondary absorptive interactions in the Angantyr model

Harsh Shah¹

¹ *Lund University*

Corresponding Author(s): harshshah12@gmail.com

TBA

Open Session with LHC Experiments - including status reports of MCnet projects/generators
/ 19

Sherpa

Corresponding Author(s): frank.krauss@durham.ac.uk

MCnet Industry Partners' Talks and discussion of secondment projects / 42

d-fine