

CORSIKA Cosmic Ray Simulation Workshop [virtual]

Report of Contributions

Contribution ID: **1**

Type: **not specified**

Welcome

Monday, June 22, 2020 2:00 PM (10 minutes)

Presenter: ULRICH, Ralf (KIT)

Contribution ID: 2

Type: **not specified**

End of workshop, final discussion

Presenter: ULRICH, Ralf (KIT)

Contribution ID: 3

Type: **not specified**

Cherenkov propagation optimization in Corsika 7 for the CTA use case

Wednesday, June 24, 2020 2:30 PM (10 minutes)

We will report about the optimization work done so far on CORSIKA 7 for the use case of CTA. We will present in particular how we have applied vectorization techniques to the Cherenkov module obtaining a speed-up of almost a factor 2.

Authors: ARRABITO, Luisa; CARRÈRE, Matthieu (LUPM IN2P3/CNRS); PARELLO, David (University of Perpignan-LIRMM/CNRS); BREGEON, Johan (IN2P3/CNRS)

Presenter: ARRABITO, Luisa

Session Classification: CORSIKA Workshop

Contribution ID: 4

Type: **not specified**

CORSIKA8 project status

Monday, June 22, 2020 2:10 PM (15 minutes)

Presenter: REININGHAUS, Maximilian (KIT / IKP)

Session Classification: CORSIKA Workshop

Contribution ID: 5

Type: **not specified**

CORSIKA8 framework structure and design

Monday, June 22, 2020 2:40 PM (15 minutes)

Presenter: Dr ALVES JUNIOR, Antonio Augusto (KIT)

Session Classification: CORSIKA Workshop

Contribution ID: 6

Type: **not specified**

Combined discussion, Q&A

Monday, June 22, 2020 2:55 PM (20 minutes)

Presenter: ULRICH, Ralf (KIT)

Session Classification: CORSIKA Workshop

Contribution ID: 7

Type: **not specified**

Input from LHCb towards understanding air showers

Monday, June 22, 2020 4:25 PM (15 minutes)

Presenter: DEMBINSKI, Hans (Max Planck Institute for Nuclear Physics, Heidelberg)

Session Classification: CORSIKA Workshop

Contribution ID: 8

Type: **not specified**

Simulation study on the effects of diffractive collisions on the prediction of the observables in ultra-high-energy cosmic ray experiments

Presenter: OHASI, Ken

Session Classification: CORSIKA Workshop

Contribution ID: 9

Type: **not specified**

Combined discussion, Q&A

Monday, June 22, 2020 4:55 PM (20 minutes)

Presenter: PIEROG, Tanguy (IKP, KIT)

Session Classification: CORSIKA Workshop

Contribution ID: 10

Type: **not specified**

A Forward Multiparticle Spectrometer for CMS

Tuesday, June 23, 2020 4:40 PM (30 minutes)

I describe a Forward Multiparticle Spectrometer (FMS) that could be installed as a new subsystem for CMS in Run 4, with p+p collisions at $\sqrt{s} = 14$ TeV and with p + O and O + O collisions. It uses a new superconducting dipole as a spectrometer magnet to measure multi-TeV charged hadron spectra behind a large radius beam pipe. The tracking detectors and calorimeters, between $z = 116$ m and 126 m, are clones of the planned CMS Endcap upgrade, supplemented by transition radiation detectors for hadron identification. In addition to measuring the spectra of π^\pm , K^\pm , p, \bar{p} and light antinuclei, charmed hadrons, J/ψ and other decaying particles can be measured at high Feynman-x. At high luminosity the FMS in a different mode can search for penetrating long-lived neutral particles. An Expression of Interest is in preparation.

Presenter: ALBROW, Mike**Session Classification:** CORSIKA Workshop

Contribution ID: **11**

Type: **not specified**

Status of CORSIKA7

Monday, June 22, 2020 2:25 PM (15 minutes)

Presenter: PIEROG, Tanguy (IKP, KIT)

Session Classification: CORSIKA Workshop

Contribution ID: **12**

Type: **not specified**

EPOS and EPOS3

Tuesday, June 23, 2020 2:00 PM (20 minutes)

Presenter: WERNER, Klaus

Session Classification: CORSIKA Workshop

Contribution ID: **13**

Type: **not specified**

SIBYLL2.3d

Tuesday, June 23, 2020 2:20 PM (15 minutes)

Presenter: RIEHN, felix (LIP, Lisbon)

Session Classification: CORSIKA Workshop

Contribution ID: **14**

Type: **not specified**

UrQMD

Tuesday, June 23, 2020 2:35 PM (15 minutes)

Presenter: BLEICHER, Marcus

Session Classification: CORSIKA Workshop

Contribution ID: **15**

Type: **not specified**

tbc

Session Classification: CORSIKA Workshop

Contribution ID: 16

Type: **not specified**

Combined discussion, Q&A

Tuesday, June 23, 2020 3:05 PM (20 minutes)

Presenter: DEMBINSKI, Hans (Max Planck Institute for Nuclear Physics, Heidelberg)

Session Classification: CORSIKA Workshop

Contribution ID: 17

Type: **not specified**

Core-Corona approach and the muon deficit

Tuesday, June 23, 2020 3:35 PM (15 minutes)

Presenter: PERLIN, Matias

Session Classification: CORSIKA Workshop

Contribution ID: **18**

Type: **not specified**

Modifying interactions in CORSIKA with MOCHI

Monday, June 22, 2020 4:40 PM (15 minutes)

Presenter: EBR, Jan (Institute of Physics, Prague)

Session Classification: CORSIKA Workshop

Contribution ID: **19**

Type: **not specified**

Lower energy hadron collisions with SMASH

Tuesday, June 23, 2020 3:50 PM (15 minutes)

Presenter: SCHÄFER, Anna

Session Classification: CORSIKA Workshop

Contribution ID: **20**

Type: **not specified**

CRMC in Geant4

Tuesday, June 23, 2020 4:05 PM (15 minutes)

Presenter: TYKHONOV, Andrii

Session Classification: CORSIKA Workshop

Contribution ID: **21**

Type: **not specified**

Combined discussion, Q&A

Tuesday, June 23, 2020 5:10 PM (20 minutes)

Presenter: PRECHELT, Remy (University of Hawai'i at Manoa)

Session Classification: CORSIKA Workshop

Contribution ID: 22

Type: **not specified**

EM cascades

Thursday, June 25, 2020 2:55 PM (15 minutes)

Presenter: MEIGHEN-BERGER, Stephan

Session Classification: CORSIKA Workshop

Contribution ID: 23

Type: **not specified**

Electromagnetic shower simulation using PROPOSAL

Thursday, June 25, 2020 3:10 PM (15 minutes)

Presenter: SACKEL, Maximilian

Session Classification: CORSIKA Workshop

Contribution ID: 24

Type: **not specified**

Simulations of radio emission for air showers penetrating from air to ice

Wednesday, June 24, 2020 4:25 PM (20 minutes)

Presenter: DE VRIES, Krijn

Session Classification: CORSIKA Workshop

Contribution ID: 25

Type: **not specified**

Simulations for in-ice radio experiments

Wednesday, June 24, 2020 4:45 PM (20 minutes)

Presenter: GLASER, Christian

Session Classification: CORSIKA Workshop

Contribution ID: 26

Type: **not specified**

Combined discussion, Q&A

Wednesday, June 24, 2020 5:05 PM (20 minutes)

Presenter: HUEGE, Tim (KIT)

Session Classification: CORSIKA Workshop

Contribution ID: 27

Type: **not specified**

Cascade equations and accelerated methods

Thursday, June 25, 2020 2:15 PM (20 minutes)

Presenter: FEDYNITCH, Anatoli (DESY Zeuthen)

Session Classification: CORSIKA Workshop

Contribution ID: 28

Type: **not specified**

Recipes for primordial soups (Astrobiology)

Thursday, June 25, 2020 4:00 PM (30 minutes)

Presenters: SCHWARZ, Dominik; LUTTER, Petra

Session Classification: CORSIKA Workshop

Contribution ID: 29

Type: **not specified**

CORSIKA: exotic physics, and pandemic research

Thursday, June 25, 2020 4:30 PM (20 minutes)

Co-author: RESCONI, Elisa

Presenter: MEIGHEN-BERGER, Stephan

Session Classification: CORSIKA Workshop

Contribution ID: **30**

Type: **not specified**

End and final discussion

Thursday, June 25, 2020 4:50 PM (15 minutes)

Presenter: ULRICH, Ralf (KIT)

Session Classification: CORSIKA Workshop

Contribution ID: **31**

Type: **not specified**

CORSIKA in Heidelberg

Thursday, June 25, 2020 2:00 PM (10 minutes)

Presenter: HINTON, Jim

Contribution ID: 32

Type: **not specified**

Random number generation in multi-threaded programs and recent developments in numpy | Efficient static dispatch mechanisms in C++

Thursday, June 25, 2020 2:35 PM (20 minutes)

Presenter: DEMBINSKI, Hans (Max Planck Institute for Nuclear Physics, Heidelberg)

Session Classification: CORSIKA Workshop

Contribution ID: 33

Type: **not specified**

General thoughts on radio in CORSIKA 8

Wednesday, June 24, 2020 3:55 PM (15 minutes)

Presenter: HUEGE, Tim (KIT)

Session Classification: CORSIKA Workshop

Contribution ID: 34

Type: **not specified**

Suggestion for a radio interface in CORSIKA 8

Wednesday, June 24, 2020 4:10 PM (15 minutes)

Presenter: PRECHELT, Remy (University of Hawai'i at Manoa)

Session Classification: CORSIKA Workshop

Contribution ID: 35

Type: **not specified**

Combined discussion, Q&A

Thursday, June 25, 2020 3:25 PM (20 minutes)

Presenter: BAACK, Dominik (TU Dortmund)

Session Classification: CORSIKA Workshop

Contribution ID: 36

Type: **not specified**

A simulation study of the effects of diffractive collisions on observables of air showers experiments

Monday, June 22, 2020 3:35 PM (15 minutes)

A hadronic interaction plays an important role in air shower development, and the detailed understanding is a key to understand the mass composition.

The diffractive collision is one of the proposed sources of the uncertainties of air shower predictions. In this work, we investigate how the difference in the diffractive collision treatment between models affects the depth of the maximum of the air shower developments X_{max} , the depth of the maximum of muon productions X_{max}^{μ} and the number of muons on the ground N_{μ} with focusing on detail characteristics of diffractive collisions; the fraction of diffractive collisions and the modeling of the diffractive collisions. We demonstrate the fraction of diffractive collisions to inelastic collisions affects 8.9 g/cm^2 and 9.5 g/cm^2 on $\langle X_{max} \rangle$ and $\langle X_{max}^{\mu} \rangle$, respectively. On the other hand, the effects of and the modeling of diffractive collisions are relatively small.

Author: OHASHI, Ken (Nagoya University)

Co-authors: Dr MENJO , Hiroaki (ISEE, Nagoya University); Prof. ITOW, Yoshitaka (ISEE/KMI Nagoya University); SAKO, Takashi (ICRR, University of Tokyo); Dr KASAHARA, Katsuaki (Shibaura Institute of Technology)

Presenter: OHASHI, Ken (Nagoya University)

Session Classification: CORSIKA Workshop

Contribution ID: 37

Type: **not specified**

Introduction & CTAO

Wednesday, June 24, 2020 2:00 PM (15 minutes)

Presenter: MAIER, Gernot

Session Classification: CORSIKA Workshop

Contribution ID: **38**

Type: **not specified**

Hadronic interaction models & IACTs

Wednesday, June 24, 2020 2:15 PM (15 minutes)

Presenter: OHISHI, Michiko (ICRR, University of Tokyo)

Session Classification: CORSIKA Workshop

Contribution ID: 39

Type: **not specified**

Cherenkov photon optimisation

Presenter: ARRABITO, luisa

Session Classification: CORSIKA Workshop

Contribution ID: 40

Type: **not specified**

Cherenkov photons on GPU

Wednesday, June 24, 2020 2:40 PM (15 minutes)

Presenter: BAACK, Dominik (TU Dortmund)

Session Classification: CORSIKA Workshop

Contribution ID: 41

Type: **not specified**

Fluorescence emission & IACTS

Wednesday, June 24, 2020 2:55 PM (15 minutes)

Presenters: MORCUENDE, Daniel (Universidad Complutense de Madrid); VAZQUEZ-POLETTI, Jose Luis (Universidad Complutense de Madrid (Spain))

Session Classification: CORSIKA Workshop

Contribution ID: 42

Type: **not specified**

Combined discussion, Q&A

Wednesday, June 24, 2020 3:10 PM (25 minutes)

Presenter: BERNLÖHR, Konrad (MPI für Kernphysik)

Session Classification: CORSIKA Workshop

Contribution ID: 43

Type: **not specified**

Sub-TeV hadronic interaction model differences and their impact on air-shower development

Monday, June 22, 2020 4:05 PM (20 minutes)

In the sub-TeV regime, popular hadronic interaction models disagree in their predictions for post-first interaction and ground-level particle spectra. These model differences generate a significant source of inherent uncertainty in their experimental utilization.

We investigate the nature and impact of such differences through a simultaneous analysis of ground level particles and first interaction scenarios. We focus on initialized events at energies close to the transition between high and low energy hadronic interaction models, where the discrepancies have been shown to be maximal. We find the models to diverge as more concrete shower scenarios are compared, pointing to characteristic differences in the models phenomenology. Finally, we discuss an argumentation for the scaling of such differences and their decrement at higher initial energies.

Authors: PASTOR GUTIÉRREZ, Álvaro (MPIK); Dr SCHOORLEMMER, Harm (MPIK); Dr PARSONS, Dan (Humboldt University of Berlin)

Presenter: PASTOR GUTIÉRREZ, Álvaro (MPIK)

Session Classification: CORSIKA Workshop

Contribution ID: 44

Type: **not specified**

FASER: very-forward neutrinos

Tuesday, June 23, 2020 4:20 PM (20 minutes)

Presenter: KLING, Felix (SLAC)

Session Classification: CORSIKA Workshop

Contribution ID: 45

Type: **not specified**

Opportunities for BSM physics in Cosmic Rays

Monday, June 22, 2020 3:50 PM (15 minutes)

Presenter: FISCHER, Oliver (Institut für Kernphysik, Karlsruher Institut für Technologie)

Session Classification: CORSIKA Workshop

Contribution ID: 46

Type: **not specified**

Diffraction in pPb collisions measured with CMS

Tuesday, June 23, 2020 2:50 PM (15 minutes)

Presenter: KHEYN, Lev

Session Classification: CORSIKA Workshop

Contribution ID: 47

Type: **not specified**

Note

Tuesday, June 23, 2020 1:55 PM (5 minutes)

Presenter: ULRICH, Ralf (KIT)

Contribution ID: 48

Type: **not specified**

Workshop photo

Thursday, June 25, 2020 2:10 PM (5 minutes)

Contribution ID: 49

Type: **not specified**

Announcement

Wednesday, June 24, 2020 1:55 PM (5 minutes)

Presenter: ULRICH, Ralf (KIT)