

Work package 1: Software, Computing, Physics NEWS

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RD-FCC Meeting
March 30, 2023

New simifellows started on March 1

- Adelina D'onofrio (Roma 3)
- Agostino De Iorio (Napoli Federico II)
- Flavia Cetorelli (Milano Bicocca)

Activity under definition/discussion

Welcome

MARK YOUR CALENDARS

- First USA FCC Workshop @BNL, 24/26 April <https://www.bnl.gov/usfccworkshop/>
 - 3 talks for IDEA
- ***End of April: Draft of internal notes for mid-term report***
- CSN1 May 17-19
- FCC Week 2023, @London, 5-9 June

GOALS about simulation/reconstruction for June FCC week

- Full simulation of IDEA in Geant4
 - prototype of PFlow reco?
 - validation of output in EDM4HEP
 - setup MC generation at CNAF
- Complete Geometry simulation in DD4HEP
- Prepare new tutorials

Plans for mid-term report: physics

- **[from management] Draft documents by end of April.**
 - ◆ results should be presented as table/plots showing detector requirements obtained from the study

→ **Candidates:**

- ◆ Higgs hadronic : extract detector requirements (CALO)
- ◆ AFB(bb): requirements on b-tag->vertex?
- ◆ Anomalous top couplings: requirements on b-tag->vertex?
- ◆ *Bs->DsK: requirement on vertexing/PID? also ECAL?*
- ◆ *Anything else new?*

Case Studies vs Detector Requirements(WIP)

	Track mom. reso	Impact Par reso	PID	ECAL reso	ECAL granularity	HadronicMassRes. PFlow	lep/pi separ.	Comments
mH from recoil mass, Z(mumu)H	+							
tau -> 3 mu	+ (collimated tracks)							
B-field monitoring from JPsi, D0's	+ (low momenta)							
B0, Bs to mumu	+						+	
Z(l)H(qq) for Hbb, Hcc, Hgg		+				+		
Vcb from W decays		+ (high purity WP)						
EW HF observables (Rb, Rc, AFB)		+						
B to K* tau tau		++ (soft tracks)	+		+ (pi0 in jets)			also efficiency for low p tracks
Tau Lifetime		+						systematics to be understood
gamma from Bs->Ds K	+	+	+	++				
Z(l)H(ss) (BSM)		+	+			+		
Vcs from W decays		+	+ (high purity WP)					
B->pi0pi0				+	+			
B->pi0pi0 w/ Dalitz		+			+			
Tau polarization (Z to tautau)			+	+	+	+(tau reco)		
ve coupling Z->vvgamma				+				
tau->mugamma				+	+(spatial)			
ALPS, ee->agamma				+	+(spatial)			
sigma(ZH) from recoil avec Z->qq						+		also testing Pflow algo
Higgs width: ee->vvH, H->bb		+				+		also testing Pflow algo
bb,cc,gg coupling ZH-> qqqq		+				++(association)		testing association/jet clustering
m(top) direct in ee->tt->qqbqqb,lvbqqb	+	+		+		++(association)		testing association/kinematic fit
Higgs Width ZH->qqqqqq		+				++(association)		testing association/kinematic fit
m(W) direct reconstruction	+			+		++		kinematic fit
AFB(bb,cc)		+				+(jet charge)		
H->inv						+		
Total x-section at the Z								inclusive. calo selection, ECAL & HCAL resolutions
LLP, very displaced objects								granularity of ECAL,HCAL,timing, Muons
electron Yukawa, H->gg (at the pole)						++		qq/gg separation

https://docs.google.com/spreadsheets/d/1BzRUynbNe_khX8LAgeQQz2tE9LV25i4rIVY83oX_ftY/edit?usp=sharing

Announcement of the EURIZON Detector School



The EURIZON school on particle detector technologies will take place at **Wuppertal** (Germany) on July 17-28, 2023.



Detector School — July, 17–28, 2023

for training young scientists on state-of-the-art particle detection technologies in the fields of particle-, heavy-ion- and neutron-physics

Lectures and hands-on exercises:

Tracking & Calorimetry
Particle Identification
Gaseous & Silicon detectors
Neutron & Photon detection

Detector readout & Data acquisition
Quantum sensing
Communication in science
Detector physics in Georgia

Website:
<https://indi.to/EURIZONdetschool>

E-mail:
EURIZON.detschool@cern.ch

International Organizing Committee:

Lucie Linssen, Eva Sicking (CERN); Simon Spannagel (DESY); Francesco Piscitelli (ESS); Jürgen Eschke, Irakli Keshelashvili, Christian J. Schmidt (GSI); Marcello Abbrescia, Nicola De Filippis (INFN-Bari); Gianluigi Cibinetto (INFN-Ferrara); Gianni Benoiventi (INFN-Frascati); Margherita Primavera (INFN-Lecce); Michael Düren, Marc Strickert (JLU Giessen); Mustafa Schmidt (Univ. Wuppertal)



Venue:  KUTAIISI INTERNATIONAL UNIVERSITY
Kutaisi, Georgia



Local Organizing Committee:

Irakli Keshelashvili, David Mchedlishvili, Levan Kankadze, Gvantsa Gabatazhvili, Levan Zaalishvili, Levan Kopaliani, David Dvali, Vakhtang Tsagareli

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 871072
Design: M. Düren, Photos: CERN



Website of the school:

<http://indi.to/EURIZONdetschool>

The deadline for applications is **April 11, 2023**.

Plans for the next meeting

- **Testbeam** analysis results
- Plans for the testbeams in 2023