# Work package 1: Software, Computing, Physics NEWS

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RD-FCC Meeting March 30, 2023

# New similfellows 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 <a href="https://www.bnl.gov/usfccworkshop/">https://www.bnl.gov/usfccworkshop/</a>
  - 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)		1			+			
B-field monitoring from JPsi, D0's	+ (low momenta)							+	
	+ (low momenta)				-	-	+	+	
B0, Bs to mumu	т					-	т.		
Z(II)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 tra	noke
Tau Lifetime		+ (SUIT HACKS)	T		+ (più in jets)			systematics to be understood	
gamma from Bs->Ds K	+	+	+	++				systematics to be underst	bod
Z(II)H(ss) ( BSM )		+	+	3.1	,	+			
Vcs from W decays		+	+ (high purity WP)			<u> </u>			
VCS HOITI W decays		т.	+ (night punity vvr)						
B->pi0pi0				+	+				
B->pi0pi0 w/ Dalitz		+			+				
Tau polarization (Z to tautau)			+	+	+	+(tau reco)			
ve coupling Z->vvgamma				+					
tau->mugamma				+	+(spatial)				
ALPS, ee->agamma				+	+(spatial)				
			2					<u></u>	
sigma(ZH) from recoil avec Z->qq	1					+		also testing Pflow algo	
Higgs width: ee->vvH, H->bb	4	+				+		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, cale selection 5	CAL & HCAL resolutions
LLP, very displaced objects			1			1		inclusive. calo selection, ECAL & HCAL resolutions granularity of ECAL,HCAL,timing, Muons	
LLF, very displaced objects			5					granulanty of ECAL, FICAL, tilling, Muons	
electron Yukawa, H->gg (at the pole)						++		gg/gg separation	

https://docs.google.com/spreadsheets/d/1BzRUynbNe khX8LAgeQQz2tE9LV25i4rlVY83oX ftY/edit?usp=sharing

#### Announcement of the EURIZON Detector School



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 Detector readout & Data acquisition

Particle Identification Quantum sensing

Gaseous & Silicon detectors Communication in science

Neutron & Photon detection Detector physics in Georgia

https://indi.to/EURIZONdetschool

International Organizing Committee:

Lucie Linssen, Eva Sicking (CERN); Simon Spannagel (DESY) Francesco Piscitelli (ESS): Jürgen Eschke, Irakli Keshelashvili Filippis (INFN-Bari), Gianluigi Cibinetto (INFN-Ferrara), Gianni Bencivenni (INEN-Frascati) Margherita Primavera (INEN-Lecce)













INTERNATION

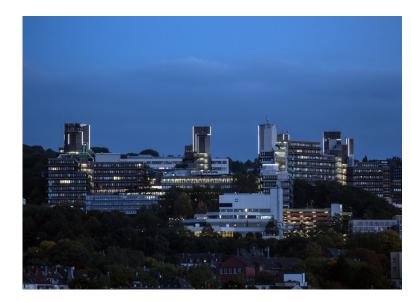
This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 871072 Design: M, Düren, Photos: CERN







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



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