News from FCC-France since May 2020 Workshop

R. Aleksan, J. Andrea, **G. Bernardi**, A. Besson, V. Boudry, L. Di Ciaccio, S. Gascon, F. Malek, S. Monteil, N. Morange, S. Muanza, L. Poggioli, R. Salerno, J. Stark

IRFU Saclay,	CPPM Marseille,	, IJCLab Orsay,	IPHC Strasbourg
IP2I Lyon,	LAPP Annecy,	LPC Clermont,	LLR Palaiseau
LPNHE Paris,	LPSC Grenoble,	L2IT Toulouse,	

- New session on Accelerator

- New session on Theory

- French activities in FCC-ee in Physics and Detectors

New since Last Workshop (I)

Session on Accelerator :

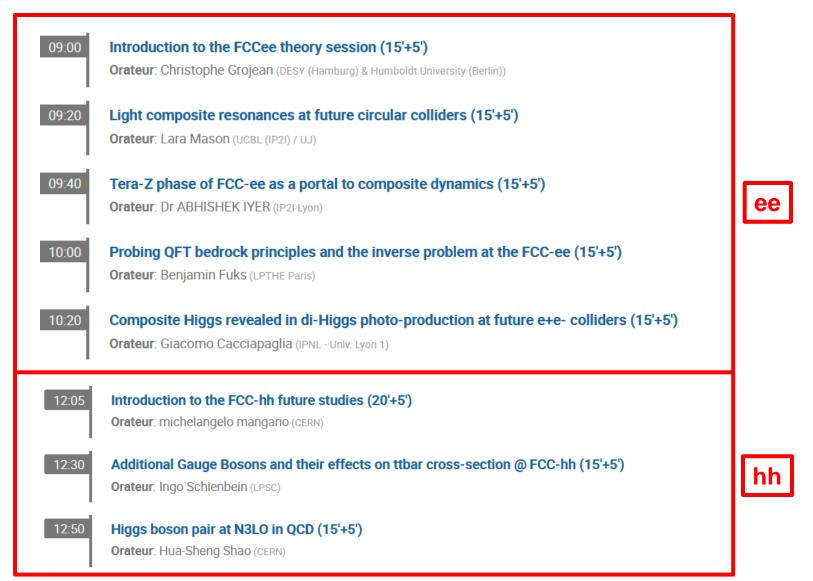
→ Chair/organizers : Angeles Faus-Golfe (IFIC and LAL) , Pierre Vedrine (CEA)



New since Last Workshop (II)

Session(s) on Theory :

→ Chair/organizers : Benjamin Fuks (LPTHE Paris), Giacomo Cacciapaglia (IPNLUniv. Lyon 1)



Preview of FCC Physics and Detector activities in the French Labs since May 2020 workshop

Work has been done on :

- R&D (sometimes related to ILC)
- Physics cases studies

It is difficult to start joint projects in this period.

IRFU CEA-Saclay (contact R. Aleksan)

Physicists involved : R.Aleksan (FCC), F. Couderc (CMS), E. Locci (CMS),

P. Schwemling (ATLAS), B. Tuchming (D0)

Physicists involved in other e+e- FC : P. Attie, M. Besancon, P. Colas, S. Ganjour, M. Titov

Physics interest :

- + EW physics (W mass, Z coupling to $\nu_{\rm e}$)
- B Physics (CP violation)

R&D :

- TPC (readout and Ion Backflow)
- Wireless detector data transmission

	Reports today
Fast Timing measurements with Micromegas (15'+5')	
Orateur: Thomas Papaevangelou (CEA Saclay)	
Ion Back Flow in TPC (15'+5')	
Orateur: Paul Colas (CEA/DAPNIA Saclay)	
The EW case for an extreme EM calorimeter resolution (15	i'+5')
Orateur: Roy Aleksan (CEA-Saclay)	
Study of Bs -> Ds K at FCC-ee and constraints on detector	(15'+5') ¶
Orateur: Roy Aleksan (CEA-Saclay)	

CPPM Marseille (contact S. Muanza)

Physicists involved : S. Muanza (ATLAS), M. Barbero (ATLAS), M. Hilali (student)

Physics interest,

- MC Generators
- Physics Beyond the Standard Model

Future R&D at CPPM

• R&D on Depleted CMOS sensors for FCC-ee (in collaboration with IPHC and IP2I)



IJCLab Orsay (contact N. Morange)

Physicists involved : N. Morange (ATLAS), M-H Schune (LHCb), J. Lefrançois (LHCb) + intern Physicists involved in other e+e- FC : R. Pöschl , D. Zerwas, M. Winter

Physics interest :

- B physics
- Higgs and EW physics

Future R& D :

- High-granularity LAr calorimeter
- Powder-O calo concept

 design de PCB/electrodes pour un calorimètre LAr (15'+5')

 Orateur: ronic chiche (LAL - IN2P3 - CNRS)

 Introduction to the Heavy-Flavor/QCD session (15'+5')

 Orateur: Marie-Hélène Schune (LAL)

 First look at Bc--> tau nu @ FCC-ee (15+5')

 Orateur: Yasmine Amhis (IJCLab)

IPHC Strasbourg (contact J. Andrea)

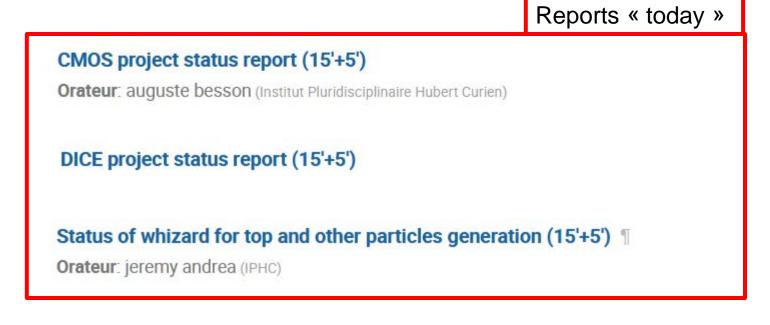
Physicists involved : J. Andrea (CMS), A. Besson (ILC), Z. Elbitar (ILC) Physicists interested : J. Baudot, G. Dujany

Physics Analysis interest

- B-physics,
- Precise top-quark measurements and EFT interpretation.

Future R&D at IPHC

- focused on pixelated detection layers: sensors & integration,
- short term: involvement in ongoing R&D projects having specs of interest to FCC



IP2I Lyon (contact S. Gascon-Shotkin)

Physicists involved : G. Boudoul (CMS), D. Contardo (CMS), S. Gascon (CMS) Physicists involved in other e+e- FC: G. Grenier, I. Laktineh, L. Mirabito

+ Theory group (4 talks)

Physics interest:

• Higgs boson physics (SM + BSM)

Current and Future R&D

- Semi-digital HCAL (sub-ns time measurement), GRPC developments
- Monolithic Active Pixel sensor (MAPs) for tracker/high-granularity calorimeters in 65nm technology

Reports today

Conceptual design studies for FCC-ee experiments, from a detector performance perspective (20'+5') Orateur: Didier Contardo (IN2P3/CNRS)

DICE project status report (15'+5')

A new read-out technique for muon detection for FCCee (15'+5')

Orateur: Imad LAKTINEH ({UNIV CLAUDE BERNARD}UMR5822)

LAPP Annecy (contact L. Di Ciaccio)

Physicists involved : L. Di Ciaccio (ATLAS)

Physicists interested: M. Delmastro, J. Levêque

Physics interest

• Higgs properties and couplings

Future R&D at LAPP

• Interest in tracker for FCC-ee (e.g. microchannel cooling)



LLR Palaiseau (contact R. Salerno)

Physicists involved : C. Ochando (CMS), R. Salerno (CMS), Y. Sirois (CMS) Physicists involved in other e+e- FC : V. Boudry, J-C Brient, F. Jimenez Morales, H. Videau

Physics interest :

• Study the EWSB (Scalar sector, Higgs self-coupling, VBS)

Future R&D @ LLR ?

• high-granularity Si-based calorimeter (continuous operation, timing)

A Calice Calorimeter for FCC-ee ? (15'+5')

Orateur: Vincent Boudry (LLR - CNRS, École polytechnique/IPP Paris)

Report today

LPC Clermont (contact S. Monteil)

Physicists involved : S. Monteil (LHCb) + 2 TH. on the first study A.Teixeira, J. Orloff. . Physicists involved in other e+e- FC : D. Boumediene

Physics interest :

Heavy Flavor Physics

Future R& D on calorimetry

• LPC is involved in R&D detector on calorimeter in the CALICE project.



LPSC Grenoble (contact F. Malek)

Physicists involved : F. Malek (ATLAS), A. Lucotte (ATLAS)

Physics interest

- EW Observables precision measurement (@TeraZ physics)
- Discovery potential in direct searches of dark matter.

Future R& D on calorimetry

• Mechanics structures and materials, Cooling, Electronics

LPNHE Paris (contact L. Poggioli)

Physicists involved : G.Bernardi (ATLAS), A.Blondel (T2K), B.Malaescu (ATLAS), G.Marchiori (ATLAS), L.Poggioli (ATLAS), Ang Li (ATLAS student)

Physicists involved in other e+e- FC : D. Lacour

Physics interest

- Electroweak (eg beam Energy calibration and polarization)
- Higgs couplings, Higgs: H to bb/cc/gg. HZ total cross section. Di-jet mass resolution
- QCD: α_s measurement at Z pole and below

Future R& D ?

Potentially oriented towards Si sensors developments, for calorimetry and tracking

 Perspectives for high-precision αS(m2Z) determinations at FCC-ee (15'+5')

 Orateur: Bogdan MALAESCU (LPNHE, Paris, FRANCE)

 Reports today

HZ cross section measurement @ FCC-ee (15'+5')

Orateurs: Ang LI (LPNHE Paris) , Gregorio Bernardi (LPNHE Paris)

L2IT Toulouse (contact J. Stark)

L2IT (Laboratoire des 2 Infinis de Toulouse) was founded on January 1st 2020. It is a CNRS/IN2P3 and Université Toulouse III - Paul Sabatier Laboratory Physicists involved : J. Stark (ATLAS) as L2IT contact (and director) for the time being

Many thanks for the talks from our foreign colleagues

- FCC general talks
- CEPC detectors
- IDEA drift chamber / IDEA Calorimeter
- B physics
- Higgs Physics
- Top Physics

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Conclusions

Some visible progress on paper, let's check it during the workshop

Physicists involved :

- About 22 permanent physicists are active in FCC-FR (and another ~14 on ILC)
- Large technical teams in all the labs will be freed once HL-LHC approach completion
- Numbers are significant, but % of involvement has to grow, taking into account HL-LHC. (Reminder: Theory and Accelerator /personpower not covered in these numbers)

Wide Physics interest :

Higgs, Electroweak, Top, Heavy Flavour, QCD, BSM

Future R&D?

- Exploit current expertise on MicroVertex, Tracking (TPC), and Calorimetry (Lar, Calice)
- Explore possible collaborations on other R&D ?

FCC and ILC communities could/should work closer