

FCC-contacts – May 25th

09:15 → 09:30 **News / FCC week**

09:30 → 09:40 **Résumé discussion Master projets**

09:40 → 09:50 **Préparation Jamboree pour nos jeunes en Juin.**

09:50 → 10:10 **Préparation meeting FCC-France-Italie du 21-23 Novembre.**

10:10 → 10:40 **Tour de table des activités dans les labos / Objectifs pour les prochains workshops**

ECFA

- ECFA workshops and seminars proceed at a steady pace
 - WG2 reconstruction meeting at DESY: <https://indico.cern.ch/event/1124095/>, 4-5 May
 - WG1 Higgs self-coupling seminar: <https://indico.cern.ch/event/1143763/>, 6 May
 - Precision calculation workshop: <https://indico.cern.ch/event/1140702/>, 7-17 June
 - What are we learning?
 - What is the positive (resp. negative) impact on the FCC Feasibility Study?
 - Reactions/Reflexions from work packages coordinators welcome
- More meetings to come with the creation of WG3 (Detectors)
 - Mandate ([link](#)) : Provide the interplay between detector R&D and physics potential realisation
 - Conveners: Felix Sefkow, Mary-Cruz Fouz, **Giovanni Marchiori**
- Take note of the EP R&D days at CERN, 20-21 June in the Globe ([link](#))
 - We might be invited for a presentation about FCC-ee detector requirements

ECFA Statement

Endorsed at Plenary ECFA 13.07.20

*“ECFA recognizes the need for the experimental and theoretical communities involved in physics studies, experiment designs and detector technologies at future Higgs factories to gather. ECFA supports a **series of workshops** with the aim to **share challenges and expertise, to explore synergies in their efforts** and to respond coherently to this priority in the European Strategy for Particle Physics (ESPP).”*

Goal: bring the entire e+e- Higgs factory effort together, foster cooperation across various projects, collaborative research programmes are to emerge

Not Granada-style competition: the point is not to compare the various projects against each others but to build a global community that will unite behind the leading project that will emerge after the next ESUPP.

The working groups will carry out work over the forthcoming years in preparation of community-wide plenary ECFA workshops

International Advisory Committee

Formed in January 2021

Involvement of

- some RECFA members
 - European leaders of possible future Higgs factories.
 - (HL)-LHC community
-
- o ECFA-chair would act as chair: Karl Jakobs
 - o From RECFA: Jean-Claude Brient, Tadeusz Lesiak, Chiara Meroni
 - o With HL-LHC experience: Jorgen D'Hondt, Max Klein, Aleandro Nisati, Roberto Tenchini
 - o For theory: Christophe Grojean, Andrea Wulzer
 - o For Linear Colliders: Steinar Stapnes, Juan Fuster, Frank Simon, Aidan Robson
 - o For Circular Colliders: Alain Blondel, Mogens Dam, Patrick Janot, Guy Wilkinson
 - o For Detector Road Map: Didier Contardo
 - o For CERN: Joachim Mnich

Working Groups

WG 1: Physics Potential

Conveners: Juan **Alcaraz** (CIEMAT - Madrid), Jenny List (DESY), Fabio **Maltoni** (UC Louvain / Bologna) and James **Wells** (Univ. Michigan) till Oct. 2021, replaced by Jorge de **Blas** (U. Granada)

- Collect, compare and harmonise the work of the different project-specific efforts
- Interplay between (HL)-LHC and a future Higgs factory, e.g. include LHC potential on high-pT measurements and EFT interpretations
- Identify specific topics where concrete work should be organised
- Requirements on accuracy in theoretical calculations and parametric uncertainties

WG 2: Physics Analysis Methods

Conveners: Patrizia **Azzi** (INFN-Padova / CERN), Fulvio **Piccinini** (INFN Pavia) and Dirk **Zerwas** (IJCLab)

- Monte Carlo generators for e^+e^- precision EW/top Higgs factory
- Software framework
- Fast simulation (and its limitations)
- Particle flow
- Luminosity measurement ...

WG 3: Detector R&D

Conveners: Felix **Sefkow** (Desy), Mary-Cruz **Fouz** (Madrid, CIEMAT), Giovanni **Marchiori** (APC Paris)

- Provide the interplay between detector R&D and physics potential realisation

On-going Activities

Preparatory meetings:

- Kick-off meeting of ECFA workshops on e+e- Higgs/EW/Top factory: CERN, June 18, 2021 (422 registered participants) [Indico](#)
- 1st Topical Meeting on Generators, Padova hybrid, Nov. 9-10, 2021. [Indico](#)
- Focus Meeting: Beamstrahlung, Zoom, Jan. 12, 2022. [Indico](#)
- 1st Topical Meeting on Simulation, Feb. 1-2, 2022 [Indico](#)
- 1st Workshop on HTE WG1, April 21-22, 2022 [Indico](#)
- 1st Topical Meeting on Reconstruction, May. 4-5, 2022 [Indico](#)

WG 1 Activities, see [indico category](#): 5 subgroups

- WG1-PREC (Precision in theory & experiment):
 - Ayres Freitas (Pittsburgh), Paolo Azzurri (Pisa), Adrian Irles (Valencia), Andreas Meyer (DESY)
- WG1-GLOB (Global interpretations in (SM)EFT and UV complete models):
 - Sven Heinemeyer (IFCA/IFT), Alexander Grohsjean (DESY), Junping Tian (Tokyo), Marcel Vos (Valencia), Jorge de Blas (Granada)
- WG1-HTE (TOP-HIGGS-EW and connection with LHC):
 - Chris Hays (Oxford), Karsten Koeneke (Freiburg), Fabio Maltoni (Louvain)
- WG1-FLAV (Heavy Flavours):
 - David Marzocca (Trieste), Stephane Monteil (Clermont Ferrand), Pablo Goldenzweig (KIT)
- WG1-SRCH (Feebly interacting particles, direct low mass searches):
 - Roberto Franceschini (Rome III), Rebeca Gonzalez (Uppsala), Filip Zarnecki (Warsaw)

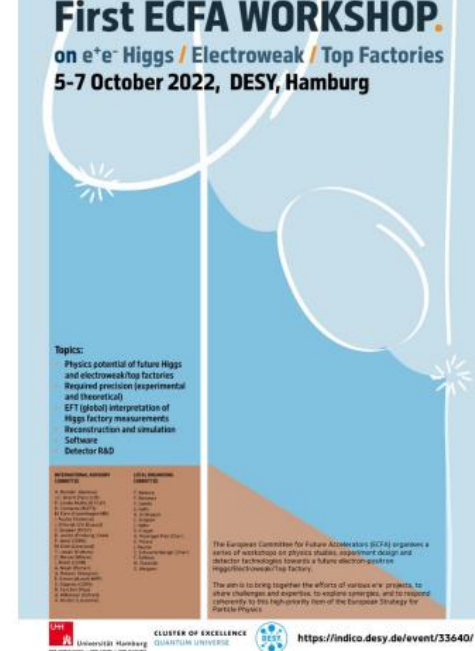
Series of monthly seminars: g-2, light quarks, Higgs self-couplings

First ECFA Workshop

Hamburg, Oct. 5-7, 2022

<https://indico.desy.de/event/33640/>

- Plenary and parallel sessions organised by WG conveners
- Poster session on Thursday afternoon by abstract submission (deadline June 30)
- Public event on Thursday evening (see next slide)
- Dinner on Wednesday evening



Public event: Thursday Oct. 6

- **Purpose:** explain “why do we need a new collider after the LHC?”
- **Targeted public:** broader scientific community and young University students (+funding bodies)
- **Format:** vision talk (30-40 min) + roundtable/discussion forum (40-60 min) with a lively moderator (questions from the public and internet)
- **Additional material:** short videos with young scientists charting the territory
- **Speaker:** H. Murayama.
- **Panel:** 6/7 members
 - F. Gianotti, B. Heinemann, K. Jakobs, H. Murayama
 - One “young” experimentalist + one “young” theorist
 - Someone outside HEP explaining the value of a new collider for other fields?
- **Important topics to be addressed:**
 - Big open questions in fundamental science?
 - How and why it came that such a machine would be needed? What are the issues in making that next big step?
 - What is the place of a Higgs factory in the realm of particle physics?
 - How science fits in society? Derived applications and Science for peace
 - How to make such a large project happen?

FCC Week in Paris: <https://indico.cern.ch/e/fccw2022>

Version: 0.15 Date: 26.04.2022

Day	Monday	Tuesday				Wednesday			Thursday				Friday	Time	
Room	Plenary Campus Cordeliers	Parallel 1 Jussieu CICSU	Parallel 2 Jussieu CICSU	Parallel 3 Jussieu CICSU	Parallel 4 Jussieu CICSU	Parallel 1 Campus Cordeliers	Parallel 2 Campus Cordeliers	Parallel 3 Réfectoire Cordeliers	Parallel 1 Campus Cordeliers	Parallel 2 Campus Cordeliers	Parallel 3 Campus Cordeliers	Parallel 4 Réfectoire Cordeliers	Plenary Campus Cordeliers	Room	
Time	room 470 p.	room 80 p.	room 80 p.	room 80 p.	room 30 p.	room 155 p.	room 75 p.	room 100 p.	room 470 p.	room 155 p.	room 75 p.	room 100 p.	room 470 p.	Time	
09:00-09:30	Plenary session	FCCee accelerator FCCIS WP2	Phy Programme/ Performance	FCCIS WP4 Socio Econom		FCC hh accelerator	PED: EPOL	FCCIS WP3 Placement	Reserve	PED/ACC: FCCee EPOL	RF Points for FCC-ee	Technology	Plenary session	09:00-09:30	
09:30-10:00		Chairperson	Chairperson	Chairperson		Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	09:30-10:00	
10:00-10:30		Chairperson	Chairperson	Chairperson		Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	10:00-10:30
10:30-11:00	Coffee break	Coffee break				Coffee break			Coffee break				Coffee break	10:30-11:00	
11:00-11:30	Plenary session	FCCee accelerator FCCIS WP2	Phy Programme/ Performance	SRF Directions for R&D	Dialogue group CLOSED	Technology	PED: Detector Concepts	Civil Engineering	Reserve	PED/ACC: FCCee MDI	Electricity and Cooling	Technology	Plenary session	11:00-11:30	
11:30-12:00		Chairperson	Chairperson	Chairperson	F. Eder	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	11:30-12:00
12:00-12:30	Chairperson	Chairperson	Chairperson	Chairperson	F. Eder	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	12:00-12:30	
12:30-13:00	Lunch break	Lunch break				Lunch break			Lunch break				Lunch break	12:30-13:00	
13:00-13:30		Lunch break				Lunch break			Lunch break					13:00-13:30	
13:30-14:00		Lunch break				Lunch break			Lunch break					13:30-14:00	
14:00-14:30	Plenary session	FCCee injector FEB	Phy Programme/ Performance	Technology SRF	SC meeting CLOSED	FCCee accelerator	PED: Detector Concepts	FCCIS WPS Collaboration	Reserve	PED/ACC: FCCee MDI	Transport & logistics, Safety		Plenary session	14:00-14:30	
14:30-15:00		Chairperson	Chairperson	Chairperson	F. Gianotti	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson	Chairperson			Chairperson	14:30-15:00
15:00-15:30	Chairperson	Coffee break				Coffee break			Coffee break				Chairperson	15:00-15:30	
15:30-16:00	Coffee break	FCCee injector FEB	Phy Programme/ Performance	Technology SRF	SC meeting CLOSED	FCCee accelerator	TI Geodesy and survey	FCCIS WPS Communication	France special plenary session (Campus or Réfectoire Cordeliers)				Chairperson	15:30-16:00	
16:00-16:30	Plenary session	Chairperson	Chairperson	Chairperson	F. Gianotti	Chairperson	Chairperson	Chairperson	Chairperson				Chairperson	16:00-16:30	
16:30-17:00		Chairperson	Chairperson	Chairperson	F. Gianotti	Chairperson	Chairperson	Chairperson	Chairperson				Chairperson	16:30-17:00	
17:00-17:30	Chairperson	Coffee break				Coffee break			Coffee break				Chairperson	17:00-17:30	
17:30-18:00	Welcome reception (Réfectoire Cordeliers)	30 May – 3 June				Conference Dinner (Théâtre du Merveilleux)			Poster session (50 posters) & drink (Réfectoire Cordeliers)				Public event (Réfectoire Cordeliers) Cocktail (Réfectoire Cordeliers)	17:30-18:00	
18:00-18:30														18:00-18:30	
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- PED summary
 - Speaker: Roberto Tenchini
- Poster session (+ drink)
 - All plenary
 - Submit abstracts (deadline 20 May)
 - Ideal for young physicists
- Register !
 - 380 registrants
 - 280 on site

FCC Week in Paris: Plenary sessions on Monday

- Current proposal

09h30: Welcome address CNRS, U. Bassler, 10 mins

09h40: Welcome address CEA, P. Chomaz, 10 mins

09h50: Welcome and introduction CERN, F. Gianotti, 15 mins

10h05: CERN Council's expectations on FCC FS, Council President, 15 mins

10h20: Swiss vision for FCC FS, Swiss Scientific Delegate, 15 mins

10h35: French vision for FCC FS, French Scientific Delegate, 15 mins

11h20: View from EC, J.E. Paquet, 30 mins

11h50: FCC Physics case: the once, the now, the future. C. Grojean, 40 mins

14h00: FCC FS overview, M. Benedikt, 30 mins

14h30: Accelerator overview, T. Raubenheimer/F. Zimmermann, 45 mins

15h15: Physics/Experiments/Detectors overview, 45 mins

Physics Programme & Performance. M. McCullough, 10 mins

Detector Concepts and MDI. M. Dam, 10 mins

Energy Calibration. A. Blondel, 10 mins

Software and Computing. G. Ganis, 10 mins

16h30: Snowmass perspective on future colliders, M. Narain (remotely) 30 mins

17h00 : CEPC and circular synergies 25mins

17h30: High Field Magnet Programme, A. Siemko, 25 mins

18h30: Welcome Reception

Parallel sessions on Tuesday morning

Chair: ? 9:00 – 10:30 Physics	
EW & Precision: Programme	J. Gluza (remote)
EW & Precision: Performance	C. Paus
Flavours: Programme	J. Kamenik
Flavours: Performance	S. Monteil

Chair: ? 11:00 – 12:30 Physics	
QCD: Programme+Performance	D. d'Enterria
Top: Programme+Performance	P. Roloff
Higgs: Programme	G. Durieux (remote)
Higgs: Performance	J. Eyserman

Parallel sessions on Tuesday afternoon

Chair: ? 14:00 – 15:30 Physics	
BSM: Programme	S. Heinemeyer
BSM: Performance	R. Gonzalez Suarez
Long-lived particle (pheno)	S. Kulkarni (remote)
Long-lived particle (case study)	J. Alimena (remote)

Chair: ? 16:00 – 17:30 Physics	
Flavour tagging (b,c,s)	K. Gautam
Towards Higgs couplings and invisible BR	M. Selvaggi
$B \rightarrow K^* \tau \tau$	T. Mirales
Software	C. Helsens (tbc)

Parallel sessions on Wednesday morning

Chair: ? 9:00 – 10:30 EPOL	
RF and energy loss effects, boosts, and control	J. Keintzel
Polarimeter and wiggler installation	K. Oide
Polarimeter 3D measurement precisions (stat and syst)	N. Muchnoi
LASER and LASER control for polarimeter	A. Martens

Chair: S. Eno 11:00 – 12:30 Detector Concepts	
Overview	M. Dam
CLD concept	A. Sailer
IDEA concept	P. Giacomelli
LAr-based concept	M. Aleksa

Parallel sessions on Wednesday afternoon

Chair: F. Gaede (tbc) **14:00 – 15:30 Detector Concepts**

Summary of GranuLAr workshop	N. Morange
Overview of Silicon tracking and vertexing R&D	A. Besson
R&D for luminometers at e+e- colliders	W. Lohmann
The Grainite calorimeter project	J. Lefrançois

Moderator: M. Chalmers **16:00 – 18:00 Physics case communication**

See presentation from Panos Charitos

- One EPOL session (Alain) and two MDI sessions (Manuela) on Thursday
 - Not under PED jurisdiction – see agenda on the FCC week site (or in Alain & Manuela's slides)
- Informal Forum of National Contacts / Dinner (Greg)
- Early Career Researcher session (Eliezer Rabinovici)
- PED summary talk on Friday morning: Roberto Tenchini

Specific events



France session (Thursday, 3 June PM)

- ITER :
- Cosmology, astroparticles : Berrie Giebels
- GANIL : Patricia Roussel-Chomaz



Public event (Thursday, 3 June PM)

Public will be mainly from scientific/physicist sphere.

All talks will be in French. Prepare English subtitles to all presentations to ensure good understanding for everyone.

Programme proposal

19h00: Introduction, G Wormser, 5 mins (confirmed)

19h05: Physics, U. Bassler, 25 mins (confirmed)

19h30: Detectors, Data, D. Contardo, 25 mins (final confirmation)

19h55: Accelerator Technology, P. Vedrine, 25 mins(confirmed)

20h20: Discussion Q&A, 30 mins

21h00 : Verre de l'amitié

Events in 2023

- FCC Week 2023: Brainstorming just started; LOC being formed.
 - Exploring the possibility of a “normal” week in UK (London? Oxford?)
 - Plan for 500-600 participants
 - Usual format: 4.5 days with Monday and Friday plenary + parallel sessions Tue-Wed-Thu
- Mid-term review 2023
 - Full plan attached to the agenda
 - PED part: Operation sequence
 - Staged increase in energy via Z, W, ZH, ttbar compared with a start at ZH
 - Impact on accelerator, cost, manpower, schedule
 - Physics case presentation in front of the SPC requested – no reply yet.
- Physics workshop in Poland (end 2022 – beginning 2023)
 - Discussions to be started soon with input from the work packages

Résumé Discussion Master-Projets

Calorimétrie
Microvertex/Tracking

Detector Concept Working Group Goals & Plans

Overall goals:

- ◆ Demonstrate that detectors can be built to fully exploit the FCC physics opportunities
 - Optimize the compatibility of the detector concepts with operation at the FCC-ee, with the Machine-Detector Interface layout (MDI), and with the timing and background conditions
 - Show that performance requirements can be met with existing or emerging technologies and realistic integration concepts
- ◆ Provide guidance for coherent detector R&D efforts to address FCC detector requirements
 - And to support their funding requests

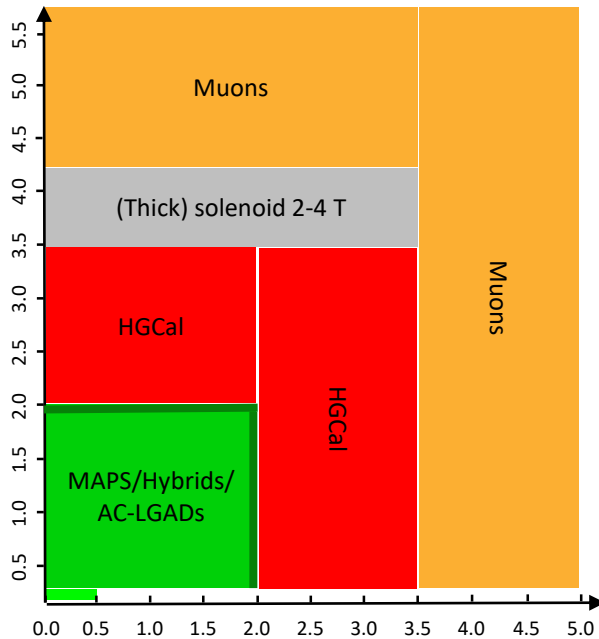
A Detector Concept eventually includes:

- Assembly of sub-detectors including magnet system
- Systems for data acquisition, processing, powering and cooling based on estimate of data rates and size
- Software implementation of detector allowing performance evaluation
- Overview of services, consumables, power consumption, and ecological impact;
- Evaluation of construction and operating costs.

Current Conceptual Design proposals

CLD

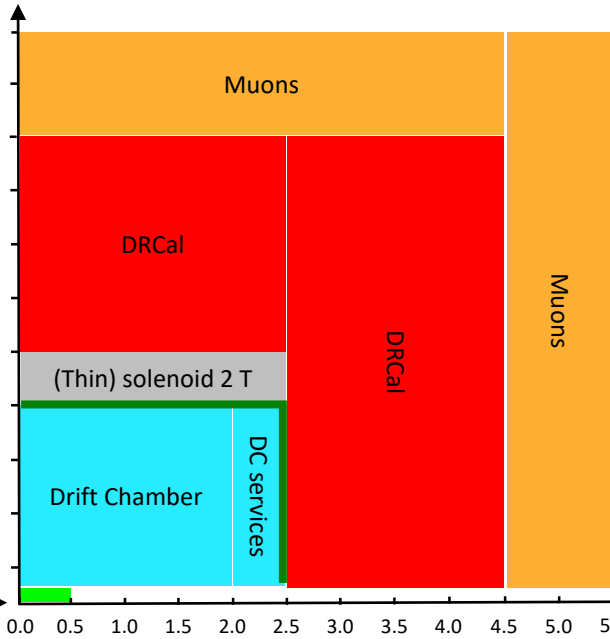
- B-field ability for 3 – 4 T
- 3D High Gran. PFlow
- Med. track IP & p_T precision
- Med.(-) γ -energy precision
- Low p PID



- PID RICH before HGCal

IDEA

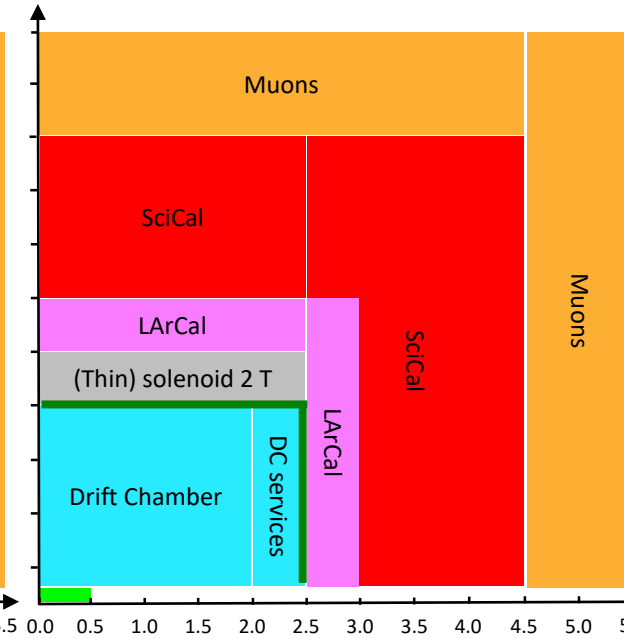
- B-field limited by X/X_0
- 2D Medium Gran. PFlow
- High track IP & p_T precision
- Med.(+) γ -energy precision
- High p PID



- TPC instead of DT

LArDet

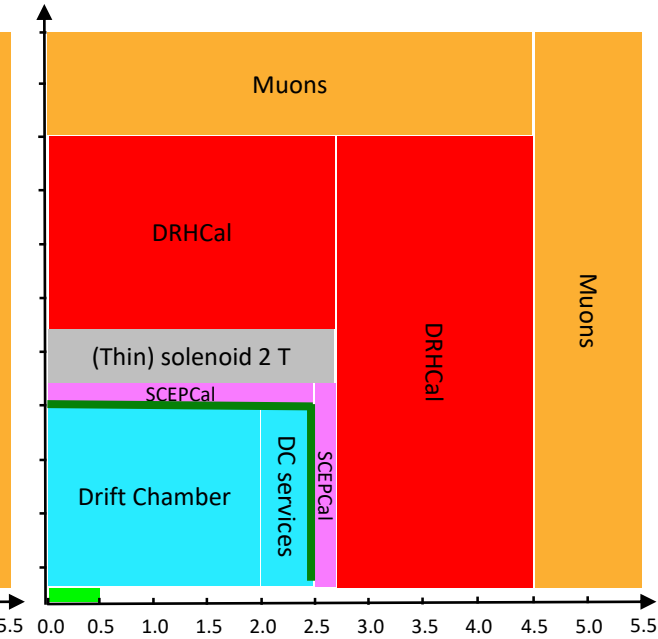
- B-field limited by X/X_0
- 3D Medium Gran. PFlow
- High track IP & p_T precision
- Med.(+) γ -energy precision
- High p PID



- TPC instead of DT

IDEA+ (SCEPCal)

- B-field ability for > 2T ?
- 2D Medium Gran. PFlow
- High track IP & p_T precision
- High γ -energy precision
- High p PID



- TPC instead of DT
- LKr instead of SCEPCal
- SciCAL instead of DRHCal

Options & Variants

- Tracking systems (w/ - w/o PID) can be exchanged in different conceptual designs

Vertex Detector: MAPS

Wrap-up/Timing: Layer MAPS/Hybrids/AC-LGADs/SPADs/MicroMegs...

MP Argon Liquide (1)

R&D de faisabilité du concept

- En cours: petites R&D sur des composants individuels: électrodes, cryostats, feedthroughs
- Objectif de moyen terme (2-3 ans): un prototype capable d'aller en faisceau test pour mesurer ses performances
 - Toute la mécanique du calo est à concevoir
 - Électronique de lecture
 - Réalisation du proto

Vers un Detector Concept compétitif

- Études de performance encore limitées à quelques chiffres clés (résolution en énergie EM, identification de π^0)
- Nécessité d'intégrer le calo dans un concept de détecteur, incluant des algos de particle flow pour la reconstruction, pour établir les perfs complètes
- Nombreuses options de design encore ouvertes, qu'une chaîne de simulation/reconstruction plus complète permettra de trancher (granularité optimale, LAr vs LKr...)

MP Argon Liquide (2)

- Actuellement seul IJCLab est engagé
- Mais intérêt de la part de plusieurs labos de rejoindre le projet
 - Bien sûr avec des ETP modestes tant pour les physiciens que pour les ingénieurs, pour l'instant
- ⇒ Échanges avec LPNHE et CPPM, intéressés par l'électronique de lecture et certains aspects de mécanique
- ⇒ Intérêt du LAPP (discussions en cours)
- ⇒ Intérêt de l'APC pour participer éventuellement aux études de performance / optimisation
- ⇒ Intérêt d'Omega pour l'électronique frontale (ASIC idéal: SKIROC mais fonctionnant à des températures cryo et avec une consommation réduite ⇒ développement intéressant)
- L'IN2P3 peut devenir moteur du projet, en collaboration avec le CERN

Contribution 'ILD' au MP FCC

Définition d'un concept ultra – granulaire

- Estimation des contraintes physiques et technologiques des calorimètres au FCC–ee [2022–23]
 - Calorimètres possibles (FR): SiW–ECAL, SDHCAL, AHCAL (DE)
 - Simulations détaillées → statistiques d'occupation, intervalle dynamique, précision temporelle
 - dissipation thermique (electronique existante ou envisageable)
 - flux de données
 - Inclusion de la digitisation (coupures, précision)
 - Cas simple : ZH , $Z \rightarrow ee$, jj , identification des π^0/γ dans les filiations τ
 - Test d'optimisation et options:
 - ECAL: regroupement de cellules (à basse E, et haut flux), B-field optimaux, précision dynamique ajustable, ...
 - SDHCAL: lecture multiplexées
- Définition du cahier des charges des senseurs, d'un ASIC, des cartes FE, des services [2023]

30 % du PD
CMS+FCC

Etude Précision des besoins en PID / Timing (↔ ILD)

[2022–23]

R&D CALICE appliquée FCC-ee

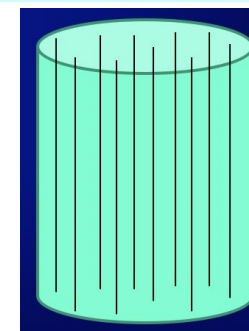
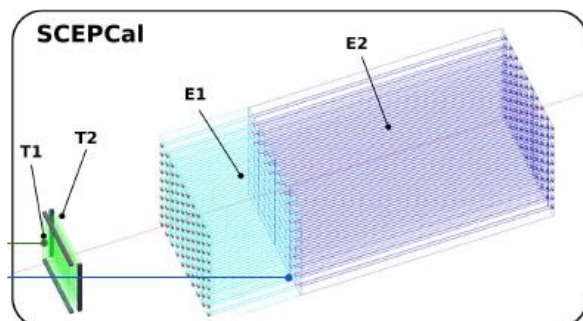
Cartes FE et ASICs:

- | | ECAL | SDHCAL |
|---------------------------------------|---|--|
| – Adaptation des cartes FE → nv ASIC: | base HGROC ou HKROC, [2024–25]
production wafer 8" | base SK3/PETIROC [2024] |
| | travail complémentaire BT CALICE / intégration expérience LUXE (ECAL) | |
| – Production d'un | SLAB long (8 cartes), [2026] | Cassette SDHCAL 3m avec lect. multiplexe + temps. [2026] |
| – Blue sky: | Evaluation d'une solution tout digital (type SPAD) basse conso. [2023–26] | |

Services :

- DAQ adaptée SLAB 1) à une lecture continue (auto-déclenchement), 2) precision en temps [2024–25]
Base: compact DAQ actuelle & SDHCAL, adaptation → ASIC (I2C) [ECAL/HCAL]
options: ajout monitoring/stat locale, trigger local ?
- Cooling :
 - ECAL: Plaque Cu + CO₂ a la HGAL : [2024–25]
si temps ingénieur...
 - Évaluation de solutions innovantes (Pulsed cooled @ CEA, μ -cooling in W , ...) [2023–25]

Vers un MP sur la calorimétrie à haute résolution en énergie et temps à cristaux , pour un concept de détecteur Dual Readout



Powder-0

- ❖ High-resolution crystal or crystal-fiber calorimeter (EM-only or EM+Had) with dual readout capability (scintillation and Cerenkov) e.g. SCEPCal

- ❖ Conserves EM/Had compensation
- ❖ High transverse granularity (Θ 1cm² down to Θ mm²)
- ❖ Energy resolution possible $\sigma(E)/E \sim 3\%/\sqrt{E} + 0.5\%$
- ❖ Precision timing possible down to Θ 10 ps

- ❖ Scintillating opaque mini-crystals/grains avec diffusion (Powder-0) :

- ❖ Energy resolution possible $\sigma E(E)/E \sim 1.5-3\%/\sqrt{E} + \sim 1\%$
- ❖ $\sigma E(\text{had})/E \sim 15\%/\sqrt{E}$ (see previous slide, for homogeneous HCAL)
- ❖ Envisaging possibility for dual readout

- ❖ Goals:

- ❖ Production de prototypes

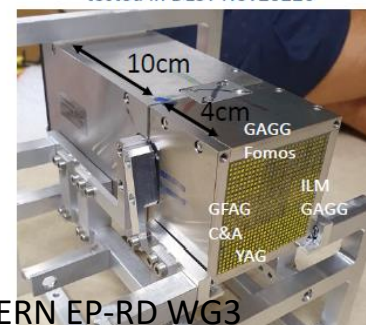
pour valider ces performances (e.g. Spacal LHCb UG):

Domaines de travail: Cristaux, photodétection, Electronique de lecture, mécanique, simulation

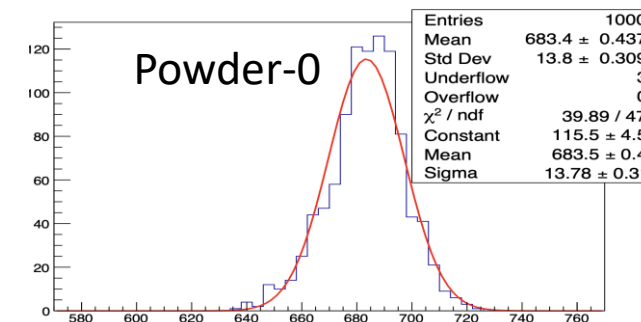
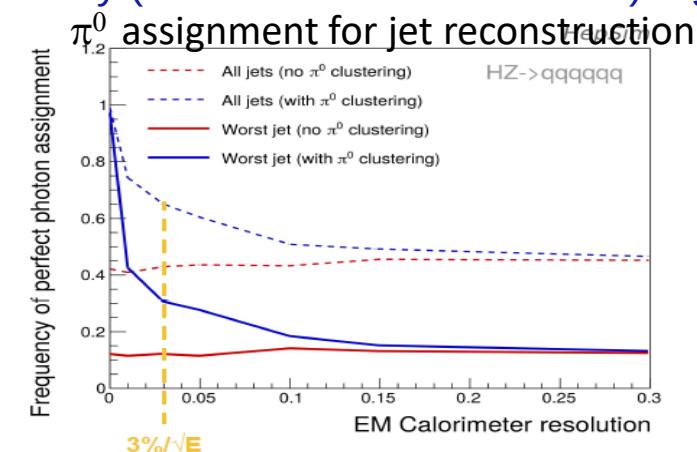
- ❖ En parallèle: Simulations, études de grandeurs fondamentales (ids, reco. masse de recul.)



SPACAL Prototype with v fibers tested in DESY



CERN EP-RD WG3



Alternating cubes 2mm $\sigma E/E = 2.0\%$

- ❖ **France** (Pas encore d'engagement formel sur cette proposition de MP) : **Discussions en cours**
 - ❖ **IP2I Lyon** (S. Gascon): Experience in R&D, production, test and operation of large homogeneous high-resolution calorimeters: (L3 BGO, CMS PbWO₄....), development and characterization of photodetection devices and readout electronics (including ASICs), expertise recente en imprimerie 3D.
 - ❖ **CPPM** (C. Morel) et **IRFU** (D. Yvon): imXgam group, members of Crystal Clear Collaboration, particular interest in timing, photodetection
 - ❖ **ILM** (UMR 5306, UCB Lyon 1/ INP-CNRS), Luminescence group: (C. Dujardin, K. Lebbou) Bulk crystal, crystal fiber and nanomaterial scintillator production and characterization, large-scale fiber production capabilities with French industrial partners.
 - ❖ **LPC** (S. Monteil) : Interest in heavy-flavor physics requiring high resolution
 - ❖ **IJCLab** (J. Lefrancois, M-H.Schune, G. Hull, S. Barsuk): Powder-0
- ❖ **International:**
 - ❖ **CERN**: EP-CMX-DA group + Crystal Clear Collaboration (E. Auffray-Hillemanns): crystals
 - ❖ **U. Milano Bicocca** (M. Lucchini et al): Algorithmes Pflow pour DR, integration dans key4hep.
 - ❖ **US community** (colleagues from L3/CMS, C. Tully, S. Eno et al): 'CALVISION' Consortium DoE proposal (CALorimetry using cerenkov and Inorganic Scintillation InnOvation): electronique de lecture...

➔ Au moins 1 concept de détecteur existe déjà (IDEA). Retours sur demandes de financements italiens et US pour cette année/l'année prochaine, il est encore temps pour nous d'avoir un rôle significatif.

Prochaines étapes

- Calorimétrie:

Continuer à affiner les différents projets, les livrables, les instituts intéressés.
Rediger une LOI

- Tracking

faire des propositions (éventuellement à partir des MP existants), puis entrer dans un cycle similaire à celui de la calorimétrie

Prochaine reunion le vendredi 17/6 à 13h, avec les collègues ILC.

Discussions à la FCC week si possible.

Préparation Jamboree Juin 2023

- Comme l'année dernière, donner une occasion à nos stagiaires et étudiants de présenter leur travail directement à FCC-France.
- Combien de stagiaires ?
- Utiliser le slot prévu pour le meeting FCC contacts de Juin ?
- Mercredi 29 juin à 9H15 ?

Préparation FCC France-Italie 21-23 Novembre à Lyon

- Première discussion informelle avec les italiens sur une possible organisation:
Gregorio Bernardi, Didier Contardo, Suzanne Gascon, Angeles Faus Golfe, Giacomo Cacciapaglia,
Franco Bedeschi, Roberto Tenchini, Aleandro Nisati, Manuela Boscolo, Fulvio Piccinini
- Lundi 21/11 démarrage à 12h30 avec lunch commun, puis session plénière introductive.
- Mardi 22/11 2 sessions parallèles: PED (incluant theorie) et Accélérateurs
- Mercredi 23/11 Session plénière de conclusion

Plus de discussions à la FCC week la semaine prochaine
Plus de Français et d'Italiens dans l'organisation.

F. Bedeschi : specifically for the detectors I see some obvious macro-areas that we may want to cover

1.Silicon tracking detectors

- a. Both France and Italy have large communities involved, but the impression is that they are pretty much decoupled. We could have a couple of talks covering the current scenario in both countries followed by a discussion on the potential for future work. For Italy the ARCADIA project and R&D on ATLASPIX3 are presently connected with FCC work, but other experts currently busy with LHC upgrade could also enlarge the picture.

2.Gas trackers

- a. Also here there are large communities involved in large gas trackers with a preference for TPC in France and one for drift chambers in Italy. There is also a wide community on muon trackers RPC and chambers of many types. An important topic is the use of large trackers for PID using cluster counting or dE/dx and the associated electronics. Also in this case a couple of overview talks followed by a guided discussion could be a way to proceed.

3.Calorimeters

- a. Here our two countries are high polarized: France for PF and Italy for Dual Readout, but in the end things are becoming more and more related. Indeed DR with timing could become a good PF detectors and there are many common electronics issues to deal with the enormous number of readout channels. For instance the development digital SiPM could be of interest to both.
- b. A crystal based EM calorimeter could be of common interest and there are already strong collaboration for CMS and its upgrade.
- c. Since calorimetry is so complex I think we should take more time and separate the hadronic and EM with two overview talks each and guided discussion.

4.Simulation and physics case studies

- a. This is another area of interest where reaching a critical mass is important.

Tour de table

