

Detector Concepts - Introduction and News

- ◆ Joined meeting between Software & Computing and Detector Concepts , 31th July 2023
 - Effectively, also joined with MDI group whos work will play a major role in the presentations of the meeting
 - Mogens Dam, Felix Sefkow (today absent), Marc-André Pleier
 - First Detector Concepts meeting since Marc-André Pleier accepted his co-convnership
 - ❖ Already started to have regular planning/discussion meetings
 - ❖ **A big welcome from Felix and myself !**

Detector Concepts – Intro and News

- ◆ Poster presentation at EPS, Hamburg in three weeks time: "Detector R&D studies for the FCC-ee"
 - AFAIK, we unfortunately have no coverage of this poster (the first appointed presenter eventually could not go)
 - If you are interested (or know of a potential person), please do sign up
- ◆ Second ECFA Workshop on e+e- Higgs/EW/Top Factories
 - Three days workshop with plenary and parallel sessions covering *WG1, Physics Potential, WG2, Physics analysis Methods, WG3, Detector R&D*
 - Deadline for abstract submission for oral presentation already passed
 - ❖ Understand from Felix (WG3 convener) that many interesting abstracts have been submitted for Detector R&D.
 - Still possible to submit abstract for posters



Intro and News - Costing

◆ Overall costing exercise

- Head of study: Anders Unnervik
- Scope: Update cost estimate of full FCC-ee project for the mid-term feasibility study
 - ❖ Including detectors

◆ Expected format for detector costing

Level	Responsible
1 Experiments	
2 Detector	
3 Support structures and scaffolding	?
3 Tracking system	}
3 Superconducting magnet	
3 Magnet shielding	
3 Calorimeters	
3 Muon	
3 Trigger	
2 Experiment technical infrastructures	
3 Industrial Gases	
3 Proximity cryogenics	
3 Shielding	
3 Tooling	}
2 Common experiment systems	
3 Data acquisition	
3 Physics data processing (online/offline computing)	
3 Detector control	
3 Experiment protection and interlock	

Agreed with Anders Unnervik that we will take care of this

Working group:
MD, Felix Sefkow, Franco Bedeschi,
Martin Aleksa, Patrick Janot

Some information already provided by us in
CE and TI Requirements Review, Oct. 2022,
<https://indico.cern.ch/event/1183771/>
Costs will be extrapolated from LHC/LEP

Intro and News - Costing (ii)

Evolving note to be submitted to Anders Unnervik "end of July"

FCC-ee Detector Costs

Some Author, Another Author, Yet Another Author

Abstract

An cost estimate for FCC-ee detectors is presented.

1 Introduction

In this note, first cost estimates of FCC-ee detector concepts are presented. The considered concepts are all at the conceptual stage and their designs are in general not yet backed up by realistic-scale prototypes. Furthermore, systematic detector optimisation studies via full simulation are still to be performed. For these reasons, the presented estimates are associated with rather large uncertainties, likely at the 50% level. In this light, the aim of this note is mainly to convey an *estimated average detector cost*. At this stage, we believe less attention should be payed to the indicated cost of the individual detectors and their comparison. In fact, we would encourage that the detailed cost estimates be treated with some degree of confidentiality.

The estimates shown are construction costs and do not cover R&D. All civil engineering and infrastructure costs, for caverns and counting rooms etc., are assumed to be covered by the machine. This assumption includes the external cryogenics for the superconducting detector magnets.

Four different cost estimates

1. CLD
2. IDEA – two different DR calorimeter solutions
 - Fibre-only
 - Crystall ECAL + Fibre HCAL
3. LAr Concept

Literally: average = 365 +/- 71 MCHF

3 Summary and Conclusion

Cost estimates were presented for three FCC-ee detector concepts, CLD, IDEA, and the concept developing around a LAr ECAL. For IDEA two alternate calorimeter layouts were considered. Hence, a total of four cost estimates were presented. Simply taking the mean of the four results in a average cost of 365 MCHF.

We conclude, at this stage, that the average cost of a FCC-ee detector lies in the range 300–400 MCHF.

15:00

→ 15:10

Information and News, Detector Concepts

🕒 10m

**Speakers:** Felix Sefkow (Deutsches Elektronen-Synchrotron (DE)), Marc-Andre Pleier, Mogens Dam (University of Copenhagen (DK))

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15:10

→ 15:30

Information and News, Software & Computing

🕒 20m

**Speaker:** Gerardo Ganis (CERN)

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15:30

→ 16:00

Progress on Noble Liquid Concept

🕒 30m

**Speaker:** Martin Aleksa (CERN)

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16:00

→ 16:30

IDEA vertex detector and its integration within FCC-ee

🕒 30m

**Speaker:** Fabrizio Palla (Universita & INFN Pisa (IT))

Joint DC and SW 31...

Joint DC and SW 31...

16:30

→ 16:50

Progress on the Vertex Detector Implementation

🕒 20m

**Speaker:** Armin Ilg (University of Zurich)

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16:50

→ 17:10

Report about the 2nd ECFA topical workshop on Reconstruction

🕒 20m

**Speaker:** Patrizia Azzi (INFN Padova (IT))