IDEA detector concept paper

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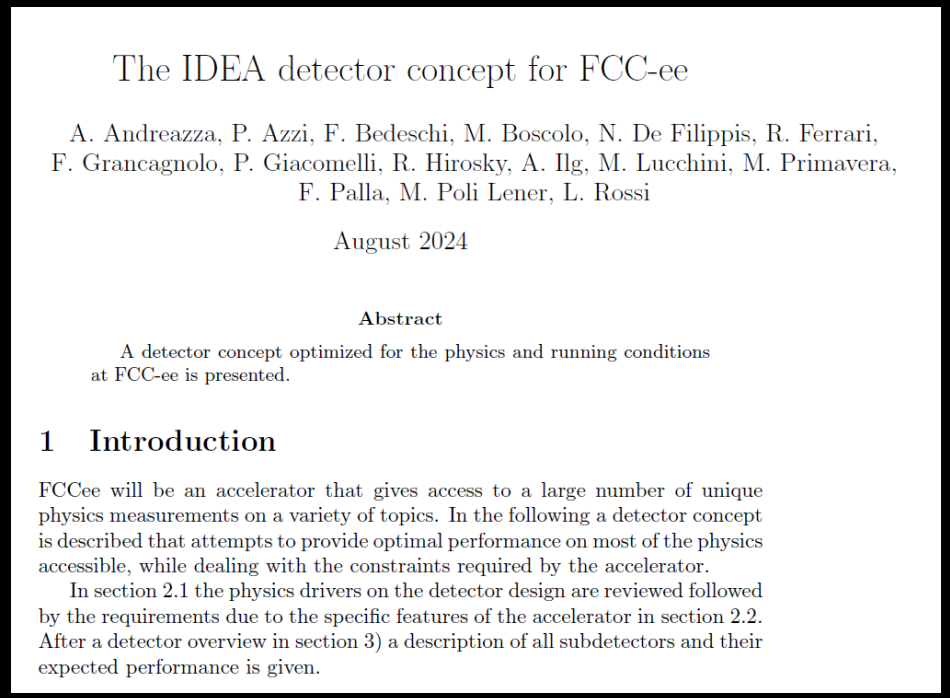
- Why
- How
- Some decisions
- Authors

WHY

- Good up-to-date reference for IDEA
  - To be used for EoI's and inputs for next EU strategy update
- Clearly define baseline configuration
  - Many versions of geometry and detector components lately
  - Define baseline and its geometry for EU strategy
    - Not fixed forever, but a clear reference is a must

HOW

- Overleaf document:
  - https://www.overleaf.com/project/66bb6199fac6a0dddd45dd4c
- Many authors
- Structure defined
  - Editors for each section
    - Chair editor/section
- Timeline
  - 1° draft before Christmas
  - EoI deadline end Jan. ‘25
  - EU deadline March ‘25



The IDEA detector concept for FCC-ee

A. Andreazza, P. Azzi, F. Bedeschi, M. Boscolo, N. De Filippis, R. Ferrari, F. Grancagnolo, P. Giacomelli, R. Hirosky, A. Ilg, M. Lucchini, M. Primavera, F. Palla, M. Poli Lener, L. Rossi

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Abstract

A detector concept optimized for the physics and running conditions at FCC-ee is presented.

1 Introduction

FCCee will be an accelerator that gives access to a large number of unique physics measurements on a variety of topics. In the following a detector concept is described that attempts to provide optimal performance on most of the physics accessible, while dealing with the constraints required by the accelerator.

In section 2.1 the physics drivers on the detector design are reviewed followed by the requirements due to the specific features of the accelerator in section 2.2. After a detector overview in section 3) a description of all subdetectors and their expected performance is given.

Decisions (1)

- Where to publish
  - arXiv document: no restrictions, but citable
  - Later configure for NIM or other
- Geometry:
  - Baseline has an EM crystal calorimeter
  - No change in DCH outer radius (2.0 m)
  - Usage of pre-shower uncertain
    - No dedicated section, but discuss in introduction
    - Additional 10 cm radial space in front of EM calorimeter to allow for future implementation (else use for services)
      - 40 cm between Si wrapper and start of solenoid

Decisions (2)

- Structure and current editors:
  - Introduction and requirements - F. Bedeschi, P. Azzi, N. De Filippis
  - Detector Overview - F. Bedeschi, P. Giacomelli
  - MDI/Beam backgrounds - M. Boscolo, F. Palla
  - Tracker introduction - A. Andreazza, N. De Filippis, A. Ilg, M. Primavera, F. Palla
  - Vertex detector - A. Andreazza, A. Ilg, F. Palla
  - Drift chamber - N. De Filippis, M. Primavera
  - Si wrapper - A. Andreazza, A. Ilg, F. Palla
  - Tracker performance - A. Andreazza, N. De Filippis, A. Ilg, M. Primavera, F. Palla
  - Crystal calorimeter - R. Hirosky, M. Lucchini
  - Solenoid - L. Rossi
  - Fiber calorimeter - R. Ferrari
  - Muon chambers - M. Poli Lener

Authors

- Author list is still open to all willing to help
- Seeking for additional editors from the wide international community
- Full list of editors needs to be defined soon
  - Sections with many editors need a chair