ESPP document
IV: Technical feasibility of the LHeC detector part

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ESPP white paper preparation meeting for LHeC

The Large Hadron electron Collider as a bridge project for CERN

***[1], ...[2],
[1] ***,
[2] ...

(Dated: November 3, 2024)

[Main eds.: Nestor, Jorgen; readers: Daniel, Monica, Uta]

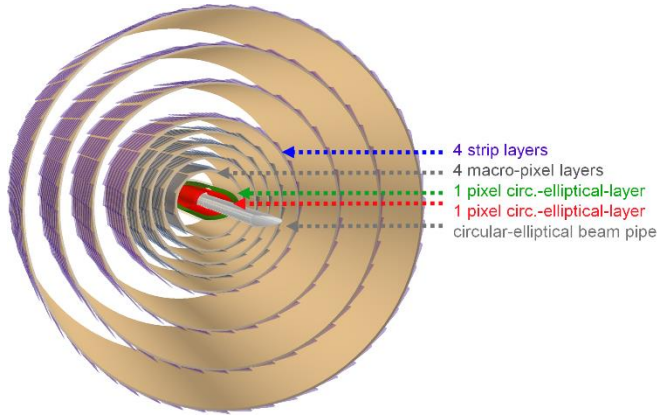
CONTENTS

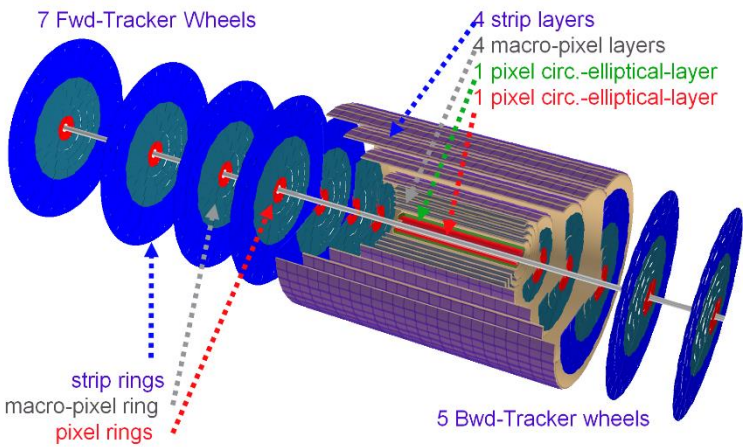
← WG4 contribution: readiness of detector (Yuji)
+ and accelerator technology (Yannis)
i.e. our contribution in 2 pages

Proposed contents of the 2p document for detector

Section 4.1:

- Introduction: detector requirements
  - high precision tracker, especially for flavour tagging at high η region
  - very hermetic calorimetry with fine EM granularity + resolution (NC) + high resolution HCAL (CC, jets)
  - muon, forward and backward
- Baseline detector design based on advanced and yet mature technologies
  - HV CMOS for central tracker + elliptical beam pipe **(with figures)**
    (further possibilities for e.g. layers in second vacuum, to optimise the performance)
  - Fine-segmented calorimeter for endcap (Si or plastic Sci) and LAr for barrel
  - Muon chambers, luminosity monitor, FPS, ZDC





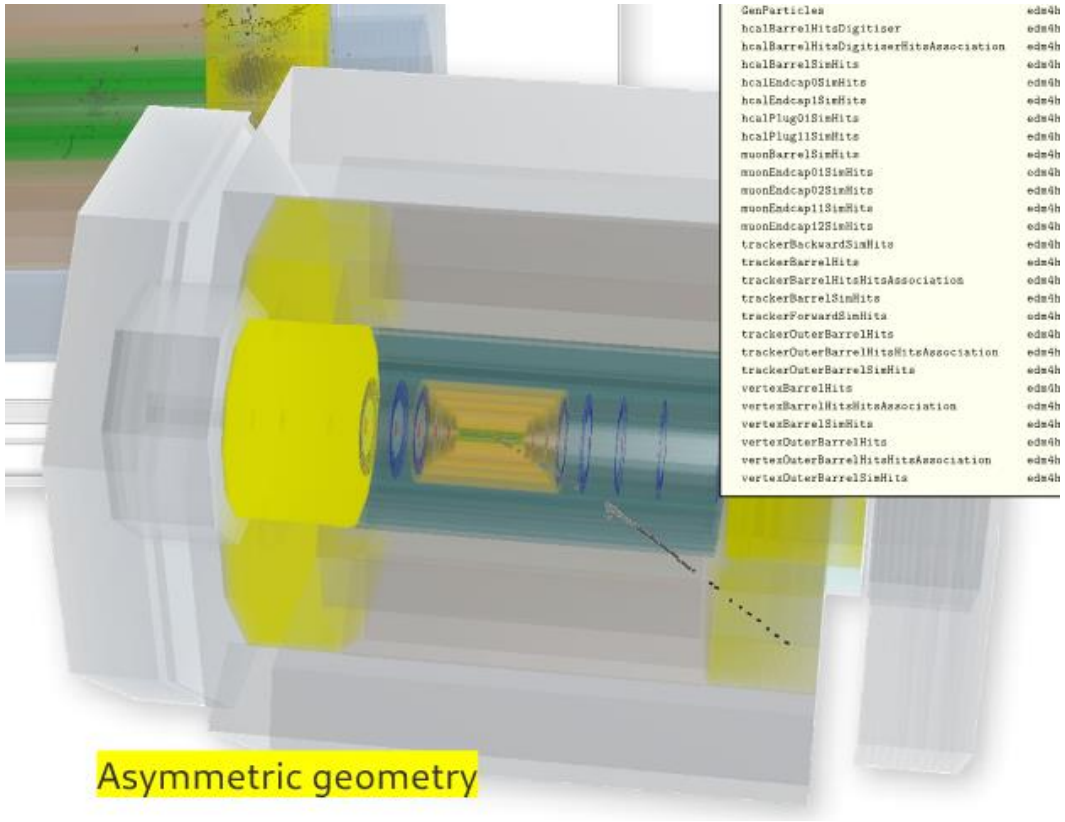
Proposed contents of the 2p document for detector

(section 4.1, cont'd)

- Streaming DAQ possible
- Detector simulation
  - in commonly used scheme (DD4Hep) **(with a figure)**
  - importing interface for generators and export interface to standard reconstruction packages
- Commenting on that: the central part of the LHeC detector is an early opportunity for detector technologies for Higgs factories

Section 4.2: machine-detector interface

- simulation results on the SR power, with a preliminary collimator scheme (in preparation by Laurent)



a snapshot from Laurent's slides (Krakow workshop)
Events from Pythia 8,
-> with e.g. Higgs to bbbar for the white paper