Status of Detector R&D
Yellow Report

CLICdp collaboration meeting
August 29th, 2018

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Scope

- Review of current status and future plans for CLIC detector technology R&D
- Backup document for Input to European Strategy Update process

- Review of results achieved since CLIC CDR in 2012:
    - CLIC detector overview and experimental conditions
    - Vertex/tracker
    - Main calorimeters → CALICE
    - Forward calorimeters → FCAL
    - Readout electronics / DAQ
    - Appendices for major software and hardware tools developed within the CLIC detector R&D studies (Timepix3 beam telescope, Caribou DAQ, Allpix^2 simulation)

- Focus on new results + CLIC-specific R&D → emphasis on vertex/tracker
- Review style, mostly citing already published material (notes, publications, proceedings, theses)
- Aim for ~100 pages (no strict limitation, but need to keep balance btw. chapters)
- Publication as CERN Yellow Report, reviewed within CLICdp

Vertex/Tracker

- Chapter editors: A. Nürnberg, DD
- Aim for ~40-50 pages + ~6p appendices
- Main sources:
  Publications, CLICdp notes, proceedings, AIDA-2020 report, theses Nilou, Matthew, Magdalena, Mateus, <u>recent unpublished results</u>
- Status:
  - chapter outline defined;
  - 10 pages of text and figures (*)

Appendices (~6 pages):

A. CaRIBOu scalable readout system

B. Beam telescope infrastructure (*)

C. Simulation tools

Main Calorimeters

- Chapter editor: K. Krüger
- Aim for ~10-12 pages
- Main sources: CLICdet note, CALICE publications + analysis notes, proceedings (overlap with other ESU documents)
- Status:
  - chapter outline defined
  - sources for material and contributors identified

Forward Calorimeters

5. Very forward calorimeters (6-8 p.)

- Chapter editor: A. Levy
- Aim for ~6-8 pages
- Main sources: CLICdet note, 2015 JINST 10 P05009, Eur. Phys. J. C 78 (2018) 135, thesis draft Itamar, conference proceedings Sasha and Veta (overlap with other ESU documents)
- Status:
  - chapter outline defined
  - Sources for material and contributors identified

Readout electronics / DAQ

6. Readout electronics and data acquisition system (8-10 p.)

6.1. Detector readout requirements . . . .

6.2. Subdetector implementation schemes (*). . . . .

    6.2.1. Example implementation for calorimeters . . . .

    6.2.2. Estimation of CLIC detector rates (*)→ Readout overview table . . . .

6.3. Power delivery and power pulsing . . . .

    6.3.1. Implementation example: vertex detector (*) . . . .

    6.3.2. Implementation example: calorimeters . → CALICE prototypes (from Katja) . . . .

6.4. Summary and Outlook . . . .

- Chapter editor: E. Sicking (with help from S. Kulis, X. Llopart and CERN CMS DAQ group)
- Aim for ~8-10 pages
- Main sources: Notes, proceedings, <u>new estimates</u>
  (cf. Eva's presentation for advisory board review)
- Status:
  - chapter outline draft
  - 5 pages of text and figures (*), including first draft of r/o overview table

Timeline

- **Mid September**: first draft including all chapters
- **Mid October**: submission of final version to PubCom, ~1 week for initial feedback + implementing it
- **End October**: start of collaboration review (~3 weeks?)
- **~End November**: deadline for review within CLICdp , ~10 days for implementing comments
- **December 1st: deadline for submission to CREB (CERN Reports Editorial Board)**
- **December 8th**: feedback from (formal) CREB review, assignment of CERN-2018-xxx number ($\rightarrow$ reference for summary report), few days for implementing comments (final editing / publishing support from CERN library group t.b.c.)
- **Mid December**: submission to CDS, arXiv
- **December 18th: deadline for community input to ESU**