

Summary Notes of

7th Institute Board Meeting of the CLIC Detector and Physics Study

Held at CERN on 2 June 2015, 12:00 - 13:45

Present at CERN: Jean-Jacques BLAISING for Yannis KARYOTAKIS (LAPP **Annecy**), Ivanka BOZOVIC-JELISAVCIC (**Vinca** Institute of Nuclear Sciences, Belgrade), Phil BURROWS (University of **Oxford**), Gerald EIGEN (University of **Bergen**), Konrad ELSENER (**CERN**), Aharon LEVY (**Tel Aviv** University), Aidan ROBSON (University of **Glasgow**), Alberto RUIZ (**Spanish Network for Future Linear Colliders**), Frank SIMON (**Max Planck Institut für Physik**, Munich), Joost VOSSEBELD (University of **Liverpool**), Leszek ZAWIEJSKI (The Henryk Niewodniczanski Institute of Nuclear Physics, **Polish Academy of Sciences**, Cracow)

Also present: Lucie LINSSEN (CERN), CLICdp spokesperson

Attended via VIDYO: Konstantin AFANACIEV (**Minsk**, Bielorrussia), Marc BOLAND (Australian Collaboration for Accelerator Science **ACAS**), Joel GOLDSTEIN (University of **Bristol**), Titi PREDA (**Institute for Space Science**, Bucharest), Jose REPOND for Marcel DEMARTEAU (**Argonne**)

Apologies/absences: Marco Aurelio DIAZ GUTIERREZ (Pontificia Universidad Catolica de Chile, **Santiago**), Mathieu BENOIT (**Geneva** University), Tomas LASTOVICKA (Institute of Physics, Academy of Sciences, **Prague**), Marek IDZIK (**AGH** University of Science and Technology, Cracow), Ivan PERIC (**KIT Karlsruhe**), Mark THOMSON (University of **Cambridge**), Nigel WATSON (University of **Birmingham**), James WELLS (University of **Michigan**) Ulrik UGGERHOJ (**Aarhus** University)

Link to Meeting (Indico page): <https://indico.cern.ch/event/390865/>

1) Welcome

Frank Simon welcomed everybody to this 7th CLICdp IB meeting, stressing that this would be the last such meeting he is chairing. He congratulated Aidan Robson for having been elected - the IB applauded Aidan.

2) Report from the Spokesperson

Lucie presented on-going key activities, and gave an outlook to the work needed for the next update of the European Strategy for Particle Physics.

a) Status of the new CLIC staging baseline

Work is in progress on a report (re-baselining document), and first full draft is expected by the end of July 2015 (much of the contents needs to be written by the

accelerator experts). The working group has decided to change the definition of a "year of CLIC operation": previously, this was defined as 200 days of running with 50% efficiency (accelerator+detector combined); now, the definition is 250 days with 50% efficiency. The first stage is at 380 GeV c.m., as decided in January 2015.

b) Status of the CLIC Higgs paper

The Higgs paper was discussed in the plenary session - there is now good hope that all ingredients will be available in a few weeks. A. Levy asked whether the new staging (380 GeV instead of 350 GeV) would still be taken into account. This would unfortunately imply too much work and time - however, indirectly and via a reference to M. Thomson's paper the new choice of 380 GeV can be referred to.

c) Progress with the new CLIC detector model

There is good progress towards a final first version of the new CLIC detector model. The working hypothesis of an $L^* = 6$ m (i.e. QD0 outside of the detector) is one of the driving elements of the new layout.

d) Upgrade of the software suite

Good progress has been made with the new geometry description (DD4hep) and with the implementation of the new detector model into the new software. Much work is still needed on a new/optimised tracking software for the all-silicon tracker, in particular for the forward region.

e) Main 2015 objectives and milestones

The first main objective, the Higgs paper, should reach completion in August this year. Parameters for the CLIC detector model which are essential for the software work should be fixed by the end of summer, while other detector parameters (such as detailed dimensions of yoke and ring coils) should be decided by November 2015.

In the discussion, it was stressed once again that the luminosity loss by the longer L^* needs to be weighed against the gain in physics, before any final decision. Among the bottlenecks identified is the track reconstruction / pattern recognition, and help by experienced people in this domain would be most welcome.

J.J. Blaising stressed that, in addition, also the generator is an important ingredient and requires a lot of work - we are hoping to use WHIZARD-2, but the evolution of this tool is not in our control.

f) CLIC 2018 strategy update

As announced at the time of CDR Vol. 3, an update of the CLIC detector design and physics reach will be needed around the end of 2018, i.e. in time of the next update of the European Strategy for Particle Physics (detailed timeline not yet decided). Ingredients to such a future report (or an assembly of documents) could be

- the 2015 Higgs paper;
- the re-baselining document;
- a forthcoming CLIC top physics paper (2016/2017?);
- documentation on the new detector model;

- documentation on BSM studies with the new detector model;
- a report on R&D and the demonstrators built by then;
- a plan of work for 2019-2025, for the case CLIC is endorsed by the European Strategy for Particle Physics.

Following Lucie's presentation on this point, Phil Burrows asked whether there was any plan of combining CLICdp efforts with FCC. This is a complex domain, since FCC groups are on the way to using different tools, and working directly together has proven to be difficult. On the one hand, the problems FCC detector teams are addressing tend to be different from CLICdp (FCC ee deals with high statistics and therefore needs to assess systematic errors very carefully; FCC hh focuses on fast simulation studies only). On the side of the R&D, discussions have been initiated with the physics department to see whether FCC R&D at CERN could be clustered with LCD.

g) Next meetings

After a short discussion, it appeared that there is a preference to scheduling a couple or more Working Group meetings on the same day (as done in the past), rather than holding another CLICdp workshop e.g. in October. An IB meeting can be scheduled when needed, but the next IB meeting firmly planned will take place during the CLIC workshop, in the week 18-22 January 2016.

3) Update of MoC Annex 4

Frank pointed out that in the present version of the MoC, "rules for rotation" are different in the Publications and in the Speakers Committee. Moreover, a somewhat too rigid statement about a "2 years limit" had been agreed upon. The proposal to change (and harmonise) the corresponding statements in Annex 4 of the MoC was approved by the IB unanimously. The new text reads as follows:

"While preserving continuation, a certain degree of rotation in the chair and membership roles of the Publication Committee (the Speakers Committee) is desirable, calling for a replacement of a fraction of the members each year."

The revised version of the MoC and its annexes can be found on EDMS at <https://edms.cern.ch/file/1353353/2/CLIC-MoC-update-9June2015-Annex1-Annex3-Annex4.pdf>

4) Organisational Matters etc.

a) New IB chair

The first organisational matter to be pointed out is the fact that, as of 1 July 2015, Aidan Robson will be acting as chair of the IB.

b) Co-convenor of CLICdp Analysis Working Group

As a consequence of his election to be co-spokesperson of DUNE, Mark Thomson has asked to be replaced for some of his roles in CLICdp. In his function as co-convenor of the analysis WG (together with Philipp Roloff, CERN), Mark will be replaced by John Marshall (Cambridge).

c) CLICdp representative in LCCPDEB

Further to the replacement of Mark Thomson, Frank Simon (MPI) will take over his role to represent CLICdp in the Linear Collider Collaboration Physics and Detectors Executive Board (LCCPDEB).

d) Spokesperson election

The present term of the CLICdp spokesperson ends in December 2015. The election will be organised by the chair of the IB, as outlined in Annex 3 of the MoC. The election process should start around end of August.

(N.B. Mark Thomson has asked to be replaced as member of the Executive Team of CLICdp once the new spokesperson will be known, and a new ET might anyhow be formed).

5) A.O.B.

The 8th IB meeting will be announced in due time. If necessary, the meeting can be held in the second part of 2015. Otherwise, a meeting is envisaged to take place during the CLIC workshop 18-22 January 2016.

(Notes drafted by Konrad Elsener - CERN, 8 June 2015)