

Conclusion from the 2nd CLIC Module Review, held the 22.6.2015

The 2nd CLIC module review was held on the 22nd of June 2015. The presentations and the list of the participants can be found on the following indico page.

<http://indico.cern.ch/event/393250/>

Markus wrote a summary of the talks and discussions which can be found under the same link.

The aim of the review was to discuss the results obtained within the working group since the first review and the emerging future work program.

The Module working group suggests the following conclusions from the review to be taken in consideration for the future work program.

1. Relevant thermo-mechanical and alignment measurements performed on the existing T0 module in the lab have been presented. Compared to the first review **good progress** has been made to measure dynamic behaviour, failure scenarios and analyse the data in comparison with theoretical models. It is possible now to make based on this measurement consistent prediction about the module behaviour. Some specified tolerances, e.g. straightness, could not be achieved and their measurement was limited in precision. Still we have to note that this particular module has a number of shortfalls compared to a real CLIC module. Several suggestions have been made to study further aspects, of mechanical hysteresis over thermal cycles, balance of heat transfer to air and water, longitudinal structure alignment and the structure straightness based on this data.
These questions should be followed up.
2. First results from the CLEX module have been presented, as well as a discussion on the problems found during installations. It can be concluded that installing the module in a real accelerator environment was a very important experience clearly indicating improvements to be made in future designs. Those concern mainly the design of the accelerating structure, the need of a compact load und studies of the excessive coupling of the two girders. Beam studies are going on and are very promising.
The team should take full advantage of exploring this module in CLEX until the end of 2016 since it is a unique opportunity to get experience with beam.
3. Alex presented the plans for the 3 module string in the lab and Jukka pointed out some difference between the test modules and the CDR description.
The new plan was accepted and should go ahead as descript. There was some discussion about the role and possible upgrades of the existing T0. The mechanical design of the choke mode flange connection should be improved to allow free movement.

4. **The future experimental program using the 3-module string was discussed and accepted.** Additional measurements and considerations were suggested. A clear breakdown scenario should be defined and used in the measurements. The heat transfer to air should be evaluated. Longitudinal movement of ACC should be studied. The improvement of the theoretical models including the FE model should be continued. The thermo-mechanical model should be used to explore and screen control strategies, and the 3-module string to test them experimentally.
5. **Concerns were expressed concerning the mechanical testbed proposal by Markus.** The working group should understand better the purpose of the planned experiments and evaluate the necessary resources before a decision should be made on this part of the program.
6. **A continuation of the present module program towards a second generation module as proposed by Carlo should be considered and included in the upcoming budget discussions.** The existing list of cost drivers for the current module should be taken into account to identify areas of improvements. The discussion about the tolerances and their exact meaning has to continue. A review of tolerances linked to value engineering of the components should be conducted, with the aim of producing a credible scheme for industrial series production of the modules.
7. **Resources concerning manpower and material budget should be checked based on this work plan.**