CLIC workshop, 16-18 October 2007
Working group: Two beam hardware and integration

CLIC Civil Engineering Layouts and Tunnel Cross Section, J. Osborne

This paper presents the current status of the general civil engineering layouts for the CLIC Project. The current baseline is for a single laser straight tunnel of 4.5m internal diameter with site lengths of approximately 19km and 29km for Phase 1(1 TeV) and Phase 2(3 TeV) respectively. The central area for Drive Beam Injectors and the Interaction Region is located on existing CERN property at Prevessin. The typical cross section for tunnel is also presented along with what assumptions have been made with regard to space allocation for the various services.

First considerations on CLIC cooling systems, J. Inigo-Golfin

Missing

How to apply scheduling work done for ILC to the CLIC project, M. Gastal

The scheduling work done for the ILC will be presented. Taking into account also the recent experience from LHC, this work could be applied to CLIC. Methods are presented and future activities proposed.

Module layout and main requirement, G. Riddone

The layout and main components of the CLIC modules will be presented. More than 20000 modules will have to be installed in the main linacs. Each two beam module is about 2 m long. The main beam comprises eight accelerating structures and quadrupoles, whereas the drive beam includes four PETS and two focusing/defocusing quadrupoles. Each PETS is connected to two accelerating structures. The main requirements for the different sub-systems (alignment, supporting, stabilization, cooling, vacuum…) are also presented together with the main integration constraints. The last part of the presentation will show the main issues related to the tunnel integration.

Transport of the CLIC modules and elements, K. Kershaw

Early integration of transport and installation considerations in the design phase of new facilities such as CLIC can have many benefits. The presentation outlines some of the issues to be considered in the design phase, in particular for tunnel transport and installation, with examples taken from the experience gained from LHC cryomagnet transport and installation.

Module test in the two beam test stand, K. Alam

The presentation will show the module test in the two beam test test. The PETS assembly procedure will be described together with tank constraints and requirements. The PETS on-off mechanism main requirement and possible concept will be also given. The last part of the presentation will be dedicated to the handling of the elements for their installation in the two beam test stand. The first short samples of the PETS copper rods have been successfully milled, and next step is the machining of a full length rod, which is 1000 mm long.

Main features of PETS tanks for TBL, F. Toral

This talk is about the conceptual design of the PETS tank prototype for TBL. The main components will be described together with the main technological choices to be done. Due to the expected high beam losses, a cooling system is necessary. Its complexity is due to the vacuum operating conditions, together with the difficulty to use brazing to clamp the cooling pipes to the copper rods. The first short samples of the copper rods have been successfully milled, and next step is the machining of a full length rod, which is 800 mm long.

PETS components and waveguide connections, D. Carillo

Presentation will deal with two components for testing the PETS (input coupler and a single test bar device) and a choke flange design to connect PETS with accelerating structures". Remarks with respect to space constraints will be also given.

Structure fabrication: dimensional tolerances, M.Taborelli

A review of the accuracy obtained on the accelerating structures manufactured so far and the respective control methods will be presented. In addition the consequences and first metrology results on longer structures will be presented.

Main requirement for module cooling, R. Nousiainen

The required stable thermal behavior and the tight tolerances of accelerating structure in the CLIC linac affect directly the integration of the cooling system. In this presentation the main components and their requirements concerning cooling are presented. Then cooling induced thermal and mechanical effects are illustrated, together with their impact on CLIC operation. The current ideas for the cooling of the module and in particular of the accelerating structure are shown and their effects are discussed.

Vacuum requirement from beam dynamics, D. Schulte

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Thin films for CLIC elements, P. Costa-Pinto

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Supporting system concept for CLIC module, R. Nousiainen

A tight level of accuracy for the collider supporting system has to be obtained during the pre-alignment, that is before the pilot beam will be injected in the CLIC machine. The main components constituting the supporting system are specified in terms of alignment and stabilization. The current supporting strategy is presented and the supporting concept is briefly introduced. A system design is viewed focused on the key component which is the supporting girder. Finally the main challenges for future work are discussed and defined.

First considerations on vacuum system, N. Hilleret

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Alignment system, H. Mainaud-Durand

One of the CLIC challenges is the pre-alignment tolerance on the transverse position of the components, which is 10 microns over a sliding window of 200 m along the 20

km of each linac. After a short introduction, this presentation will detail the solutions foreseen for the pre-alignment, and will show what remains to do in order to prove the feasibility of such a precise pre-alignment."

Test beam line. F. Toral

A TBL mover prototype has been developed at CIEMAT in the framework of CTF3 Collaboration. The conceptual and engineering design will be shortly reviewed, including a short description of the fabrication process. Tests done at CIEMAT will be reported, together with the open points to study during the next tests to be performed at CERN in the following months.

Stabilisation system, A. Jeremie

Stabilisation of accelerator components is necessary in the context of the nanometre size beams planned in CLIC since the ground on which they are attached already moves by several nanometres. Some activities including seismic sensors, laser interferometry and stable support studies are planned around the CTF3 two-beam test bench where 1nm at 1Hz has to be achieved. In addition, in preparation for CLIC Final focus design, active damping will be studied on a specific test bench with a final focus mock-up where 0,1nm above a few Hz has to be achieved.

Drive beam transfer lines, B. Jeanneret

A preliminary layout of the long return line of the drive beam in the main tunnel will be presented.
Issues related to its connection to the turnaround loops will be discussed. Space occupancy in the section of the main tunnel where both a fresh drive beam enter the decelerator and the spent one is dumped will be sketched.

Main beam transfer lines, A. Latina

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Main Linac Quadrupoles, T. Zicker

About 2090 electromagnetic quadrupoles per linac will be needed for the CLIC main beam linac. The requirements and constraints will be discussed and a preliminary design for the Quadrupoles (MBQ) with an integrated magnetic corrector will be proposed. The expected performance, the magnet main parameters and required future work will be presented.

BPM integration and beam instrumentation, L. Søby

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BPM for TBL: status of the amplifier, Y. Koubichine, G. Montoro

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