

Minutes of the 28th "ILC-CLIC e+ studies" meeting

Date: March 22nd, 2012

16:00(JST), 9:00(Ukr), 8:00(CET), 2:00(US-IL), 00:00(US-CA)

A part of Attendees (whom Omori was able to hear the voices):
Louis(CERN), Eugene(NSC-KIPT), Sabine(DESY), Friedrich(DESY),
Olufemi(?), Wei(ANL), Wanming(ANL), Kuriki(Hiroshima),
Takahashi(Hiroshima), Yokoya(KEK), Urakawa(KEK), and Omori(KEK)

Agenda:

1. 300Hz Linac scheme and the cost: Urakawa-san
2. Agenda for KILC12: Wei-san

Presentations:

http://www-jlc.kek.jp/~omori/ILC-CLIC-e+Studies/20120322/20120322-Urakawa_300HzCost.pdf

http://www-jlc.kek.jp/~omori/ILC-CLIC-e+Studies/20120322/20120322-Wei_AgendaKILC12.pdf

1. 300Hz Linac scheme and the cost:

Urakawa-san reported the detail of the RF-gun and linacs of the 300 Hz conventional source and the const estimation.

Please look at "[20120322-Urakawa_300HzCost.pdf](http://www-jlc.kek.jp/~omori/ILC-CLIC-e+Studies/20120322/20120322-Urakawa_300HzCost.pdf)".

(a) RF-gun:

Urakawa's group already demonstrated 100-bunch generation by using RF-guns. Bunch charge was about 1-2 nC. Pulse length of the 100 bunches was about 1 micro second. The excellent bunch-to-bunch energy-compensation was already demonstrated.

As a next step, the group has a plan of 1000 and 2000 bunch generations, with 5nC/bunch. Calculations show good results.

The RF_guns employ standing wave acceleration.

(b) Linacs:

Urakawa made the design of high current 300 Hz linacs; one is the 6 GeV drive-linac and the other is the 5 GeV booster linac.

Both linacs have the very similar scheme. The scheme consists of the main RF system and the correction RF system. The frequency of the RF is 2.6 GHz (S-band).

Both linacs are required to accelerate multi-bunch high-current beams of the 300 Hz conventional source.

Here is a list of the requirements to the linacs.

- * Number of bunches is 132 in a RF pulse.
- * The pulse length is about 1 micro second.
- * Repetition rate of the pulses is 300 Hz.
- * 132 bunches are gathered in a triplet.
- * The triplet has 3 mini-trains.
- * There is a 100ns gap between two adjacent mini-trains.
- * The mini-train has 44 bunches.
- * The bunch-to-bunch separation is 6.15 ns.
- * In the drive linac, bunch charge is 3.2 nC.
- * In the booster linac, bunch charge is 4.8 nC.
- * The drive linac accelerate electrons which create positrons in the target.
- * The booster linac accelerate positrons which are created in the target.

The correction RF cavities of the linacs are necessary to compensate the energy spread caused by the acceleration of high current, the multi-bunch, and the triplet structure of the beams.

In the the linacs, the traveling-wave acceleration is employed in both the main cavities and the correction cavities. The lengths of the accelerating structure are 3 meters for the main RF system and 0.33 meters for the correction RF system.

You can see the details of the cost in the table. Please look at "20120322-Urakawa_300HzLinacCostTable.pdf".

Urakawa said that the cost information on the table is open.

The total cost is 26,793 M Yen for 6GeV and 5GeV S-band 300Hz linacs. This does not include the tunnel, the target, and the capture system.

Discussions:

Wei-san's Question:

What is the Q-value of cavities?

Urakawa-san's Answer:

unloaded Q of the main cavity = 13000
unloaded Q of the correction cavity = 850

Yokoya-san's Question:

Is the system flexible to the change of the bunch-timing structure? For example, can we employ doublet-structure instead of triplet-structure?

Urakawa-san's Answer:

The system is very flexible. We can treat the change of a bunch-timing-structure by changing the phase difference of the main and the correction RF systems. However we have one restriction. It is very difficult to make the total length of a RF pulse longer than 1 micro second.

2. Agenda for KILC12:

Wei-san proposed an agenda of the ACFA-GDE joint meeting in Korea(KLIC12).

Please look at "[20120322-Wei_AgendaKILC12.pdf](#)".

Format:

- * All discussions, TDR driven
- * One hour session (roughly) for each major technical area, with power point.
- * Concentrating on: Parameters, Target, AMD, and Lattices.
- * Updating from others (undulator/Cavity/Collimators and so on if any).
- * Alternative Schemes (300 Hz and Compton)
- * Costing
- * Draft TDR
- * Joint sessions with others (DR, CFS)

Others:

Yokoya said that the accelerator part of KILC12 was basically dedicated to ILC. However, of course, CLIC talks are not prevented. We will have 3 hours of the sessions for alternatives. CLIC talks can be presented in the sessions.

Reported by T. OMORI

The date of the next phone meeting is April 12nd (Thu.).