

Accelerator Design & Integration (AD&I) webex meeting

13th October, 2010

Agenda items

- A. AD&I related items at the upcoming IWLC workshop next week
- B. 'Standard' parameter sets for the TDP design

Participants

E. Paterson (Chair), A. Seryi, D. H. Hayano, J. Brau, J. Clarke, J. Carwardine (scribe), K. Buesser, K. Fujii, K. Kubo, M. Thompson, P. Garbincius, T. Shidara, T. Markiewicz, T. Omori, W. Gai, W. Bialowons

Apologies: M. Ross, M. Walker, A. Yamamoto

Slides from the meeting are here:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4823>

A. IWLC 2010 at CERN next week

(See slides on Indico)

Ewan presented slides from Marc Ross highlighting sessions and topics of specific interest to AD&I.

Monday afternoon is the opening joint plenary at CERN.

On Tuesday morning, there will be a joint session on Accelerator Design & Integration. For ILC, this session is an important forum for open communication and interaction between the accelerator and physics/detector groups on ILC/TDP design options for TDP. Talks:

Basic considerations on LC lumi & energy needs (up to 3 TeV) - Jim Brau

Low energy running for CLIC - Daniel Schulte

SB2009/ Low energy running for ILC - Andrei Seryi

A full hour has been set aside for discussion.

The Tuesday afternoon accelerator plenary is dedicated to reports on the major accelerator R&D activities: Superconducting RF, and machine studies at ATF, CesrTA, and FLASH. There will also be reports on the CLIC CDR and ILC TDR

Summaries from the parallel Working Group sessions will be given at the Friday morning accelerator plenary.

Parallel Working Group sessions will be held on Wednesday and Thursday. There several topics of particular importance to AD&I:

WG1 (E-/E+ sources):

Consolidation of machine parameters including operation with low center-of-mass energy

Parameters for high-field undulator running

WG2 (Damping Rings):

The Damping Ring RF system is a big topic for ILC for the 10Hz/low power option. The cost impact of running with a 50% duty factor is a potential show-stopper for the low-power option. This session on RF will be Common with WG3, WG8, and WG4. Electron Cloud mitigation

This workshop marks a milestone since the E-Cloud studies at CesrTA are coming to an end.

Final recommendations for E-Cloud mitigation in the TDP design will be presented
Also there will be a discussion on 3km and 6km damping ring options

Peter: what is the goal of this session on DR RF? Ewan: try to understand the cost implications for the RF system, and to consider technical options and whether we have a reasonable technical approach.

BDS/MDI

Proposal for novel final doublet solution, especially for the low Ecm running Positron Source (beam-beam) parameters in general (within MDI group)

It was noted that the BDS/MDI working group tends to act as a conduit for communication between the accelerator and physics/detector communities.

4. Simulations / RTML

- Completion of the emittance budget document
- Gradient tilt - need also to identify any work still needed
- GUINEA-PIG simulations (traveling FOCUS) - make recommendations on what should be done next.

WG3 (SCRF)

Discussions on reducing the tunnel dimensions

WG5 (BDS/MDI)

There is a series of talks on MDI

BDS is plays a major role in any of the parameter sets

The BDS/MDI sessions have particular significance for AD&I since they a primary focal point for interaction with the Physics/Detector communities.

WG9 (CFS)

There will be a big discussion on the push-pull detector options for both ILC and CLIC
Joint sessions with WG5 and WG3 will be held on the interaction region and reducing tunnel volume

B. 'Standard' Baseline Parameters

(See slides on Indico)

Ewan presented slides on issues and questions on establishing standard parameter sets at IWLC next week.

The intention had been to establish an agreed-upon set of 'standard' baseline parameters before the IWLC workshop, but it has turned out to be not so straight forward.

A link has been distributed by Nick to an EDMS document listing Machine parameters (working assumptions) for SB2009 (updated) configuration. It includes parameters for $E_{cm} = 200, 250, 350, 500 \text{ GeV}$ as well as parameter set for the 1TeV upgrade.

Regarding standard parameters for the 1TeV upgrade option, it is assumed that any upgrade to 1TeV would also include going to the full-power option. Reducing the repetition rate from 5Hz to 4Hz is because it is assumed we would not increase the total beam power and therefore not, for example, rebuild the main beam dump during the upgrade (too radioactive).

Establishing an agreed-upon set of standard parameters is complicated by the many assumptions that must go into the Guinea-Pig simulations. Results of the simulations depend on how the various simulation switches are set, and consequently results of simulations can vary by as much as 25%.

In order to establish standard parameter sets, we must agree on the set of assumptions (hidden or at least not obvious) for the simulations or analytical calculations.

Ewan showed a comparison of the most recent simulations performed by Tauchi-san with those from December 2009 and the Sendai meeting. The significant differences need to be worked out before we can come up with a standard set of parameters

Ewan: Any discussion at this point?

Andrei: it would be a good idea to have a discussion at the CERN workshop. Ewan: we would need a small number of people to develop the working set of assumptions. In of itself, this shouldn't be a big deal to do and part of the problem may be terminology.

Ewan: it's clear that the low energy and 1TeV options are going to be given significant attention in coming year - not so much of a focus since the RDR.

Peter: are we expected to do much with the 1TeV option before the end of TDP-II? Ewan: we need to look at upgrade options to go from 500GeV to 1TeV and to get an idea of the cost.

Peter: since in SB2009 we are setting up quads and cryomodules for the 500GeV option, would we have to exchange all the quads in an upgrade to 1TeV? If so, does that mean we would have to remove all the cryomodules from the tunnel? Ewan: we'll have to work through that as part of understanding what's needed and what is an optimum strategy. It's clear that inevitably, any upgrade to 1TeV would clearly require a major machine shutdown.

Peter: we would need to make sure that selected candidate sites are big enough to accommodate a 1TeV machine (~50km end-to-end). Omori-san noted that there are two candidates for asian sites, both of which are suitable for 50km-long machine.

Ewan: This has always been a stated requirement and does not change.

Andrei: with respect to the absolute values for luminosity, it has been pointed out repeatedly by Nick that we can't really know the achievable luminosity within a factor two.

Given this, we should focus our attentions on the relative differences between simulation results rather than the absolute numbers. Ewan: yes, agreed.

Peter: there seems to be little or no time on the schedule allocated to preparing for BAW #2. Ewan: yes, the schedule is very full, partly because the meeting combines what were previously two separate workshops. Preparations for BAW2 will have to be done over future webex sessions and by e-mail.

There was no further discussion.

Next AD&I meeting:

- 10th November - Traveling focus simulations, physics detector studies

There will be two more AD&I meetings ahead of the second Baseline Assessment Workshop (BAW #2) in January:

- 8th December - Upgrade / risk mitigation strategies, CFS impact
- 5th January - Workshop preparations and program review