

# 21. Accelerator Systems WebEx Conference

## 05 August 2009, 13:00 GMT

Minutes (v1.2)

**Attending: P. Garbincius, F. Lehner, T. Omori, M. Palmer, M. Ross, A. Seryi, T. Shidara, N. Solyak, N. Toge, J. Urakawa (Chair), A. Yamamoto, K. Yokoya**

Agenda and Minutes also available on the indico site:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4093>

### 1. Welcome and News (J. Urakawa)

J. Urakawa welcomed the attendees. There was no news reported.

### 2. Short status report by TAGLs

#### **BDS/ATF2 (A. Seryi):**

During summer, the ATF2 activities proceeded with the upgrade of the Shintake monitor and its laser system, with manufacturing of the multi-OTR and preparation of new electronics for ATF2 Extraction line strip-line BPMs. The tests of MonaLisa interferometer force compensated vacuum chamber were completed successfully, and installation of the MonaLisa system is planned for end of 2009. The ATF2 team is also developing detailed schedule for Fall-Winter 09 commissioning activity.

The work on IR and MDI received significant push forward with two month working visit of Alain Herve (ETH-Zürich group at CERN) to SLAC during May - July of 2009, and also a one week visit of Klaus Sinram (ILD / DESY) to SLAC in June. Frequent discussions were held with SiD engineers and SLAC resident engineers and physicists.

The goal of this period was to make progress on a practical push-pull design where different concepts (SiD/ILD, SiD/4th or ILD/4th) could co-exist. The work focused primarily on the configuration of shielding, motion systems for detectors and supports of the final doublet.

The design work started with the assumption that present design choices of the concepts (in particular whether a platform is employed) would be respected.

For the shielding design, it was quickly concluded that present design differences between the SiD and ILD pacman shielding could be eliminated and a common

design adopted. Considerations of how to integrate additional shielding around the 4th with pacman shields were begun.

An IR layout was developed that attempts to provide a seamless floor for a detector that does not roll in on a platform while permitting the use of a platform for the second detector.

Subsequent discussions resulted in the conclusion that further progress on design choices for the detector supports and motion systems could only be made after a quantitative vibration and stability analysis of the combined detector/support/motion system was developed, focused in particular on the effect of ground and local vibration sources on the stability of the final doublet. In connection with this analysis a cross-regional experimental program was proposed and various analytic tools discussed.

The work at BNL on ILC IR quad continued, with the first layers of the 2meter long prototype manufactured and being analyzed. The design of ATF2 SC quad at BNL is proceeding well, aiming toward review of the final design by late 2009, when interfaces for cryo system will be also finalized with KEK.

The beam dump design work is going through the phase of review. Satyamurthy Polepalle (BARC) is now leading the beam dump design. Dr. Polepalle is currently visiting SLAC for three weeks, working with SLAC colleagues on review of the work done at BARC over past year. The results include a complete CFD (Computational Fluid Dynamics) study of the beam dump, including distribution of water vortex velocity, temperature in the water, window and vessel, methods of cooling the window with an additional jet, etc., that allow to freeze all its parameters and proceed with more detailed technical design.

**ATF R&D (J. Urakawa):**

ATF is preparing 4 sets of modified fast pulsers and modified strip-line kicker electrodes for a second fast kicker bunch by bunch beam extraction system. It is scheduled to be commissioned/tested in the October operation run. 40 % of the ring BPM circuits (about 40 BPM circuits) will be replaced in October and November. All replacements will be complete by the end of March 2010. The upgraded BPM system will allow a better control (correction) of the coupling in the ring.

**CesrTA (M.Palmer):**

A CESR upgrade down took place from June 16 to July 26, 2009. Major CesrTA upgrade activities included:

- Installation of wiggler vacuum chamber with grooved surface for electron cloud mitigation (CU-KEK-LBNL-SLAC). Chamber has 3 retarding field analyzers
- Installation of amorphous carbon coated chamber along with an Al “control” chamber in drift region (directly illuminated by arc dipoles) for mitigation tests (CU-CERN collaboration)
- Installation of a grooved chamber in a chicane dipole (SLAC)
- Installation of an instrumented quadrupole chamber
- Installation of solenoid windings in drift regions around CESR (presently this task is approximately two-thirds complete)
- Upgrade of an x-ray beam line which will support a high resolution beam size monitor for use with ultra-low emittance electron beams

The down was also used to complete a number of CESR-related maintenance activities.

#### *CESR Startup and Experimental Run:*

CESR was returned to operational status on July 23, 2009 with first beam stored early the following morning. A principal issue during the startup and first two weeks of the CesrTA run is machine scrubbing. During the scrubbing period we are continuously monitoring the electron cloud currents in the 29 retarding field analyzers that are deployed around CESR. This will help us to evaluate the effects of processing of the surfaces of the various vacuum chambers. Machine scrubbing activities are expected to continue into the week of August 10.

Since July 31<sup>st</sup>, daytime and evening shifts have been directed towards machine development shifts and CesrTA experimental activities while overnight shifts have been devoted to machine scrubbing. Particular activities have included:

- Electron cloud measurements with RFA and TE wave techniques
- 5 GeV optics development
- X-ray beam size monitor alignment and commissioning activities
- Visible beam size monitor alignment and commissioning activities
- General instrumentation and feedback system commissioning activities

The CesrTA experimental run will continue until September 8<sup>th</sup>. During the week of August 10 we intend to switch to operations at 2.1 GeV with our ultra-low emittance optics. Key activities for the remainder of the run include:

- Low emittance operations and tuning
- Continued instrumentation development
- Characterization of the effectiveness of the new vacuum chambers with electron cloud mitigations
- Continued measurements (eg, bunch-by-bunch tunes) to characterize the EC build-up around CESR
- Studies of electron cloud instabilities in low and ultra-low emittance conditions

- Implementation of intermediate energy optics (from 2.5 to 4GeV) to facilitate measurements over a wide parameter range (eg, IBS studies)

**Positron Source R&D (J. Urakawa):**

KEK is preparing hardware for hybrid target system with a 1mm W crystal, located at the end of the KEKB Linac. We are planning first experiments in mid-September. The French group (Orsay, Lyon and CERN) is preparing simulation results for the experiment which should be ready by the time of the run.

The BINP Liquid Pb target prototype will be sent to KEK around October and BINP is preparing a short collaboration report/proposal for a beam experiment at the end of ATF linac.

**RTML (N. Solyak):**

The major RTML activity was focused in following areas:

1. Single-stage bunch compressor lattice design and evaluation
  - a. Lattice was modified to improve performances and tuneability. All cryomodules were replaced with Type-4 cryomodules, Wiggler design is now similar to that used in the baseline RDR design. Diagnostic section and extraction line elements were also reviewed.
  - b. Extraction Line used after single-stage bunch compressor was re-designed. After a few iterations we now have a pretty good design, which transports an extract compressed beam with ~3.6% energy spread. The latest design use three sextupoles and no collimators. Preliminary results were presented at CLIC-ILC LET workshop at CERN (23 June 2009). Now we are working on documentation: report, lattice file, specs for elements and counts of components.
2. CFS and cost estimation.
  - a. RTML system prepared and provided updated information for the CFS group. We had two meetings with the CFS group (FNAL and SLAC) to discuss RTML configuration, requirements (power, water, etc ..) and constraints.
  - b. Started re-evaluation of the RTML layout and lattice to integrate it into the proposed new configuration for the central injector area. We are trying to define constraints for the new lattice, which will preserve the required functionality of the RTML and does not deteriorate the performance.
3. Preparation for RF phase/amplitude stability studies to demonstrate requirements needed for RTML bunch compressor. Studies are being considered as part of the September 9mA run at FLASH/DESY
  - a. Proposal and request for studies was submitted

- b. Few meeting (including webex), e-mail exchanges and phone calls with experts were set-up to discuss details of experiment.

### **3. PM status and information report (M. Ross)**

Marc explained the on-going preparation for the ALCPG Workshop to be held in Albuquerque, New Mexico from September 29 - October 03, 2009. The PMs have drafted goal statements and will release them to the TAGs next week. The hope is to decide on working assumptions for the strawman baseline layout SB2009. During ALCPG work has to start towards the SB2009 proposal report to be submitted to Barry and to the EC by end of this year followed by an in-depth review by the AAP in January 2010.

Marc encouraged all participants to register at the ALCPG workshop site <http://panda.unm.edu/LCWA09/> and look at the agenda how SB2009 discussion can further be added.

He further mentioned that Jonathan Bagger (future ILCSC chair) will take part in a panel discussion at ALCPG. Moreover, a talk was added in the workshop program by a SNS project manager on SCRF.

As regards AD&I a lot of activity on action items is going on in general. There will be also a report from the availability study group at ALCPG. Marc and Nick will clarify the AD&I meeting situation, since it has led to some confusion previously.

**The next TAGL meeting is tentatively set on 02 September 2009 at 13:00 GMT.**