Minutes of the Joint COMPASS and AMBER TB meeting of 13^{th} July 2021

S. Levorato

November 1, 2021

Attendace via Zoom only

Franco Bradamante, Jens Barth, Oleg Kiselev, Oleg Denisov, Fulvio Tessarotto, Stefano Levorato, Bernhard Ketzer, Moritz Veit, Christian Dreisbach, Daniele Panzieri, Christophe Menezes Pires, Jan Michel Friedrich, Jan Matoušek, Karl Flöthner, Maxim Alekseev, Michael Pešek, Martin Losekamm, Norihiro Doshita, Shuddha Dasgupta, Igor Konorov, Vincent Andrieux, Eva-Maria Kabuss, Bakur Parsamyan, Evgeni Maev, Vladimir Anosov, Daniele D'Ago, Silvia Dalla Torre

The material presented during the meeting is available at https://indico.cern.ch/event/988387/

The meeting starts at 14:00 pm

Agenda

1 Approval of the minutes of the Technical Board held on 4 May 2021
2 News and communications
3 Beam commissioning status and plans
4 PT Update
5 Silicon update
6 GEM update
7 H1 and Trigger
8 DC status update
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1 Approval of the minutes the TB of 23 March 2021 *S. Levorato*

Minutes approved

2 News and Communications *S. Levorato*

- The the minutes of the Technical Board held on 4 May 2021 are approved

a CERN EN-EL is progressing with the project ELECNSOL to verify existing electrical installations and check if they are conforming according to CERN regulation. All new electrical installations have to be inspected.

b The 908 gas flammable zone system is in operation, flammable gases are available since 23 of June

c The Beam delivery schedule has been changed: week 28 is dedicated to the control system interventions of the beam-line. The fist low intensity beam will be available since 12 of July.

d On July 3 the Helium 3 recovery line of the COMPASS PT collapsed. The problem has been identified in a non adequate thickness (2mm) of the pipe for the operational condition from the system (few mBar). TE-CRG, responsible for the line is working to replace the collapsed part of the pipe with 3mm thick 304L stainless steel tube in the shortest time possible. The remaining part of the line, going from the concrete block of the experimental hall till the pump room is still 2 mm thick. The 6 m long pipe may be subject to the same phenomenon of collapse and represents a weak point of the system. A discussion has started with TE-CRG to reinforce it.

e During the commissioning of the Silicon Tracker cooling system an overpressure caused by a wrong operation of the exhaust line valve has resulted in a deformation of the detector windows. One of the detector station (SI03) presented a damaged window which had to be replaced to recover the nominal vacuum level to operate the trackers.

f Rich Wall was successfully installed on 17 June

g H1 was successfully moved from the COMPASS clean room 891 and reinstalled in the COMPASS hall on 24 June

h The ECAL1 and HCAL1 platform were successfully moved in nominal position on 25 June, SM2 was moved to SIDIS position the very same day.

i The power lines for the AMBER DAQ infrastructure and the TPC Gas circulation system are being installed. They should be ready for the beginning of September

l During the PRM pilot run, no gas circulation system will be used for the IKAR TPC, the hydrogen will be vented out just after monitoring its contamination. All the material needed for the gas system has been purchased. The TPC has been successfully tested at 12.5 BarG and a preliminary leak measurement of the empty TPC volume has shown no issue. The TC underlines the need of defining the schedule and the manpower needs for the realization of the gas system.

3 PT Update *N. Doshita*

Norihiro Doshita reports about the status of polarized target. After the discovery of the super-fluid leak of the target holder on May 27 the target material was unloaded. An intense campaign to locate the problem was organized. The test at the CERN CRYO lab have shown the integrity of the target holder and indicated the missing compression of the indium joint to be suspected for the vacuum degradation. The material was reloaded on June 30. On July 3 the Helium 3 recovery line has collapsed. The 2 mm thickness of the pipe has been computed by TE-CRG not to be enough for the PT operation. A new pipe, 3 mm thick is in preparation. A possible schedule is also presented: material loading is foreseen at the end of July.

4 COLD silicon update *C. Dreisbach*

C. Dreisbach gives updates about cold silicon stations. The 3 stations have been installed in the COMPASS hall next to the PT platform. The cooling system and its control have been re installed and are being commissioned with the help of EP-DT and Saclay from remote. A Problem was discovered with CV134 (by-pass valve) since its setting was inverted.
An accident occurred during the detector commissioning: the vacuum equipment outlet of the nitrogen was closed and the nitrogen input was not removed. It resulted in a over-pressure of $\approx$0.7 bar that bent the window foil and the support structures towards the outside, resulting also in the stretching of the window material and a reduced leak tightness for station 3. The damaged windows of this station was repaired by adding an extra Kapton foil. All stations are now presenting good vacuum level.

5 GEM update *B. Ketzer*

Bernhard Ketzer reports about the status of GEM and Pixel Gem systems. The new LV adapter cables have been produced at CERN and successfully tested after minor modification. The new R&S power supply installed and connected to the GEM stations. GM01 has been reinstalled on DC4 on 12 July, GM02 on DC5 on 13 July. All GEM FEE are operational, the HV is being raised back to nominal values. The central GEM switches based on CAEN A516 modules will be replaced by LAN I/O interfaces.
One of the two newly built GEM detectors is ready but during the testing phase the HV stabilized resistive divider did not operated correctly, the possible fallback solution is the use of a classical divider. For the second detector one GEM foils is unstable and has to be replaced.
The new FEE cards are ready as well as the new ADC designed at TUM. The ADC firmware needs to be developed, the configuration interface to the config server is being developed by V. Frolov. A first station may be ready to be installed in September.

6 H1 Status report *B. M. Veit*

Benjamin Moritz Veit reports about the status of H1. The new air light guides were constructed out of 3M Specular Film DF2000MA with 0.5 mm G10 support material on each side resulting in a more rigid construction as before. A second layer of aluminized Mylar was added to minimize cross-talk between slabs.
Slabs wrapping was performed to minimize gaps between slabs: 364.5 mm module width. Small adjustments of Rohacell were needed afterwards to minimize gaps between modules. All the modules are sandwiched between aluminum bars at transition between light-guide and scintillator. Rohacell is hold together by cable ties between modules. While installing soft-iron shielding the distance between holder and light guide was measured too narrow, this resulted in breaking the gluing of slab3 Saleve side. The too narrow space was due to the mechanical deformation of the support in horizontal position resolving itself when the detector is rotated in vertical position. It was decided not to repair the broken slab since the light loss can be compensated by a corresponding HV increase. H1 was transported and installed into the hall on 24 June.
A new centering foam support is being used to have PMTs and the light guides aligned to avoid off axis positioning of the system .
The trigger system on 13.07.2021 was tested with the first beam on 13 of July. The Read-Out is working, the discriminators and logic is working, some broken PMTs will be exchanged. There are remaining issues mainly in Ladder4/5 and Middle4/5 X (not in trigger). The estimated time for trigger commissioning is 10 to 12 days after beam is available.

7 DC status update *V. Andrieux*

Vincent Andrieux reports about the status of DCs. For DC5 the short preventing YY' plane to be operated was discovered on January 2021 and diagnosed to be a broken wire in region y07 and y08. Several sense wires are connected to ground through ≈10 kΩ due to a defect of isolation worsening with time. This prevents the YY' plane to be operated with floating sense wires.
For the other DC5 planes and improved grounding of FEM digital part through RJ45 cage resulted in a reduction of the threshold levels to nearly nominal values. The grounding scheme between digital, detector, power and shielding domains requires further studies to improve furthermore the FEE noise levels.
Straws 3 HV migration to CAEN was implemented in DCS and the mapping checked. The detector is ready.
For DC4 on 8 July a sudden raise of current in FW and Cathode was measured for Y plane. The 10µA surge last 3min before it tripped. A HV mapping mistake was also discovered. The Y' cathode appears to be grounded.
For DC0 the BK current for the V plane had increased reaching the trip limit. The problem has not been understood.
For DC00 all planes working (HV, LV, RO) fine but DC00VV'BK still requires clarification, for DC01 all planes are working (HV, LV, RO), DC04 presents a broken wire on Y', investigation for partial RO of the plane is ongoing, for DC05 all planes working (HV, LV, RO) but YY' which cannot be operated, for ST03 all planes are working (HV, LV, RO).

8 DC5 repair planning *C. Riedl*

Caroline Riedl reports about the planning for the DC5. No repair intervention is foreseen before the SOR. The loosening of the centering frame holes on G10 is considered by the experts the reason of the wire breaking. Modified centering pins will be prepared for the winter shutdown intervention.

9 W45 update *C. Azevedo*

Carlos Azevedo comments about the status of W45 stations. Station 3 plane V1 presents a short circuit resulting in half of a plane to be off. All positive HV channels are giving a large leakage current that is correlated to the hall humidity. After 17 June all detectors have been powered to nominal HV values and a preliminary threshold scanning performed. No major difference has been observed with respect to 2018 thresholds levels.

10 RWall and MWPC status a *D. Panzieri*

D. Panzieri updates the Technical Board about the status of the RWall and of the MWPC. All the RWall planes are under gas flow. After the final assembly some problems in flushing the whole half planes were noticed and fixed.

All the FEs have been installed and minor problems in the RO with missing FEs are being fixed.
The MWPCs system is ready and fully equipped. Due to a tight schedule for the software integration and a the firmware preparation delay the PA05 will be operated in the 2021 RUN with standard FEEs.

11 RICH1 status *S. Dasgupta*

Shuddha Dasgupta reports about the preparation of the RICH-1. HV LV and FEE for all detectors MWPCs, Hybrids and MAPMTs are operational and working without problem. The gas detectors not yet tested at nominal voltage. The CH_4 filters of the gas system have yet to be back from CERN Gas department. Enough C_4F_10 for 2021 is ready to be filled before the data taking.

12 Ecal1 and Ecal2 Status status *S. Donskov*

Serguey Donskov reports about ECAL1 and ECAL2 status. ECAL1: the light diodes monitoring system is in preparation. The light adapters with LEDs cards were prepared and tested for the Shashlyk and LG counters. 7 more devices should be produced for the LG bundles. PC boards are available the components have been ordered. The new power supply for OLGA and MAINZ HV is ordered too. The HV for GAMS part is on and the calorimeter is included into DCS monitoring. There is still a problem with the encoder for vertical movement of the detector.
ECAL2: the refurbishment of the shaper crates power supply is finished. Some problems appeared at the level of the shaper cards. The HV is on and the calorimeter is included into the DCS monitoring. The encoder for horizontal positioning system is not operating correctly.

13 Planning for 2021 run *J. Matoušek*

Jan Matoušek reports about the planning of 2021 run. Physics data taking is expected to start middle of August leaving for 2021 3 periods of about 2 weeks each for SIDIS run.

14 PRM Unified Tracking Station Update *Martin J. Losekamm*

Martin J. Losekamm reports about the status of the Unified Tracking Station. A new design has been produced to integrate the at least 3 planes of ALPIDE tracking stations and include the services needed. A discussion with surveyors has started to include in the detector design the target positions for the UTS position measurement.

15 IKAR report *E. Maev*

Evgeny Maev reports about the status of IKAR TPC. The IKAR TPC has been equipped with new components: anode multi pin connectors and HV cathode connectors as well as the high pressure valve. All the 20 IKAR flanges with the copper rings were changed with new ones equipped with viton o-rings. The TPC flanges have been remounted and the pressure (12.5 bar) and vacuum leak tests been performed successfully.
The two new segmented anode planes (totally 60 pads) were produced and transported to CERN. The new system for the electric field shaping is under preparation and the installation of the new inner IKAR structure is planned during the period 15 August- 15 September. The final IKAR pressure tests and the gas filling with helium first and hydrogen after are planned at the end of September.

16 AoB

- No other arguments are proposed.

The meeting ends at 18:30 pm.