MINUTES of the 114th Meeting of the SPSC  
Held on Tuesday 24 June and Wednesday 25 June 2014

OPEN SESSION

1. Status and plans of the OPERA experiment  Giovanni De Lellis  
2. Status and plans of the ICARUS experiment  Paola Sala  
3. Status and plans of the NA63 experiment  Ulrik Uggerhoj  
4. Status and plans of the COMPASS experiment  Andrea Bressan  
5. CLOUD status and long term plans  Jasper Kirkby  
6. Proposal to search for polarisation effects in the antiproton production process  Dieter Grzonka

CLOSED SESSION

Present:


1) Present on Tuesday only  
2) Present on Wednesday only

Apologies: S. Bertolucci, A. Jokinen, T. Lasserre, R. Saban
1. DRAFT MINUTES OF THE 113th MEETING OF THE SPSC HELD ON 8 APRIL AND 9 APRIL 2014

The minutes of SPSC113 were approved (CERN-SPSC-2014-017, SPSC-113).

2. CHAIRMAN’S REPORT FROM RB208

The Chairman reported on the Research Board (RB) meeting, RB208. The following points were presented and, where necessary, discussed.

1) The SPSC summarised the performance improvements achieved by AEGIS on its components in the AD hall, and the plans towards first gravity measurements with antihydrogen in the coming years.
2) The Committee also presented the progress of the GBAR experiment in improving its design on many key issues for a future measurement of free fall of antihydrogen at rest.
3) The SPSC presented the steady progress in the construction and installation of the NA62 complete experimental setup for a first physics run end of 2014.
4) New results from the RD52/DREAM calorimetry Collaboration, based on the data taken in 2012, were presented, as well as their plans for new data taking in 2014 and 2015.
5) The SPSC summarised the plans of the WA104 and WA105 neutrino R&D Collaborations and expressed its support to the programmes as well as its request for further information on the necessary financial and manpower resources needed to implement them.
6) The Committee presented the result of its review of the proposal for a search for light dark matter, P348. The SPSC recommended a short test run in order to validate the main assumptions of the proposal and to provide input for a future detailed technical design report to be submitted to the SPSC.

The Research Board noted points 1) to 5) and endorsed point 6).

3. STATUS OF ACCELERATORS

R. Steerenberg reported on the start up of the injector accelerators after the long shutdown (LS1).

The PS Booster has quite successfully taken beam on 2 June 2014 and managed to accelerate and extract $4.8 \times 10^{12}$ of the $7.5 \times 10^{12}$ protons injected on one of the four rings. This indicates that still work remains to be done, such as re-commissioning the new resonance compensation system and the new digital low-level beam control.

Beam injection to the PS followed on 20 June 2014 and today about $1 \times 10^{12}$ protons have been injected, accelerated up to 26 GeV/c and extracted to the external beam dump. This is promising and indicates that there are no obstacles in the machine. Soon all the changed and new system are scheduled to be commissioned with beam and the next major step will be the beam based re-alignment and adjustment of the magnets to improve the orbit.
The LINAC3 ion source is being commissioned with Argon and the LEIR cold checkout has started.

The SPS machine is on schedule and will close on 27 June 2014 and enter the hardware test phase. The conditioning of the injection kicker system, the inflector, is ongoing. The SPS scrubbing run was re-scheduled and will now take place in two separate weeks. As a result the set-up of the North Area has been advanced by one week in order to avoid losing physics time.

The work on the AD horn strip-line is progressing well. The removal of the old and damaged line was completed and the test bench has been successfully validated with the refurbished spare strip-line. The first tests have been made with current up to 380 kV. If the final tests are also successful, the installation in the AD target zone will start. The first beam on target is planned for 1 August 2014.

4. STATUS OF EXPERIMENTAL AREAS

Lau Gatignon described the ongoing activities in the East, North and AD experimental areas.

In the East Area the construction of the new irradiation zones is progressing. The construction of the new control rooms is now well under way. Once the CHARM control room construction is completed, the installation of the roof shield over the mixed field irradiation zone itself can start. The start of the new irradiation facilities, with low intensity beam and without ventilation until the second half of October, will have to wait for the shielding.

On the test beam and CLOUD side some work still needs to be finished before the start of the T9 and T10 beams on the 15 July 2014. In particular the replacement of the “marguerite” primary target by a new target unit of optimised design remains to be done in the first week of July. A cooling interlock issue on the newly replaced quadrupole magnet F61.QDE2, located inside the PS main ring zone, remains to be solved. The safety tests (access system validation) are scheduled for 7 July 2014. The layout of the T9 zone had to be changed, partly related to more stringent shielding requirements for the irradiation areas but also in view of the experiment to be performed by the winning schools of the “Beam Line for Schools” competition. In a special restricted session on 22 May 2014, the SPSC selected two schools: a team from Athens/Greece for a measurement of the ratio $\pi^+ \rightarrow e^+ \nu / \pi^- \rightarrow \mu^- \nu$ and a team from Nijmegen/Netherlands for the calibration of a homemade crystal calorimeter. The idea is that the calorimeter becomes part of the experiment. Technical and implementation details are currently being worked out with the experimental teams.

In the North Area a large effort is going into the consolidation and repairs in the splitter and primary target zones TDC2/TCC2. The work on the ventilation system and the chilled water circuits has been completed. The cabling campaign and electrical works, critical for the planning and allowed intensities of the forthcoming proton runs, has started as planned. In parallel the repair of the main beam dump collimator (TAX) jack protections is progressing well: two thirds of the work have been completed. The material for the target and target instrumentation consolidation is ready for installation. A thorough survey campaign is under way as well.
In the North Area halls the installations of GIF++ and of NA62 are progressing and the preparations for the shielding reinforcement (300 extra concrete blocks) in view of primary ion beams to NA61 are under way. The COMPASS Drell-Yan preparations are on track.

Preparations of the AWAKE facility are on schedule. The proton beam line has been dismantled, the modifications in the electron source area have been done and the shielding wall is being constructed. Design and integration drawings are well advanced. The civil engineering work for the laser and electron tunnels are starting now.

The start of physics in the AD is still foreseen for August 19th, following the issues with the horn strip line. The infrastructure in the new building B393 is ready. The installation of the BASE beam and detectors is progressing well; the critical Y-shaped vacuum chambers are available. Once beam is available, some time must be dedicated to optics verifications in the beam line to BASE, ALPHA, ATRAP and ASACUSA, because of changes related to BASE and to the ELENA branch-off. Installation work in the experiments is also progressing well.

5. PS AND SPS USER SCHEDULES

H. Wilkens presented the updated SPS user schedule, taking into account the advanced date of the SPS physics start, and the planned week of accelerator scrubbing in week 45. The Trans-National Access programme, providing travel funding for PS and SPS user, in the framework of the EU funded AIDA project and as well the possible future AIDA-2020 project were presented.

6. DISCUSSION OF THE OPEN SESSION

6.1 OPERA

The SPSC congratulates the OPERA collaboration for the progress achieved in scanning and analysing the emulsion bricks, leading to the current observation of four tau neutrino candidates with a significance for tau neutrino appearance at 4.2 sigma confidence level. The Committee is also pleased with the update of the search for sterile neutrinos and is looking forward to the publication of the results. The Committee encourages the collaboration to proceed towards the completion of the analysis of the entire data set to reach the best final sensitivity.

The Committee appreciates the satisfactory compromise reached between the Gran Sasso Laboratory and the OPERA collaboration on the de-commissioning strategy and the underground storage of bricks at LNGS.

6.2 ICARUS

The Committee notes with pleasure the progress made by the collaboration on basic performance and analysis tools for the ICARUS Time Projection Chamber (TPC) providing a basis for the use of large Liquid Argon TPC’s for future neutrino programmes.

The SPSC encourages the collaboration to proceed further with the analysis of all data samples, including the low-energy atmospheric events.
6.3 COMPASS

The SPSC is pleased to see good progress in analysing and publishing results of both the hadron and muon beam programmes. The Committee congratulates the COMPASS collaboration for the observation of a new meson $a_1(1420)$.

The SPSC acknowledges that the preparation for the Drell-Yan run in 2014 is progressing well. The SPSC notes with satisfaction that a new technical coordinator has been appointed. The Committee encourages the collaboration to finalise the definition of the setup for the deep virtual Compton scattering (DVCS) programme based on the analysis of the 2012 pilot run.

6.4 CLOUD

The SPSC welcomes the detailed report (SPSC-P-317-ADD-4) prepared by the CLOUD consortium, describing the results achieved so far and describing the rationale for the long term planning of the experiment. The SPSC congratulates the consortium on the internationally leading results, which were achieved since 2009.

The committee recognises the unique opportunity CERN offers to study and understand how fine particles and atmospheric ions from cosmic rays act on clouds and recommends that the proposed experimental runs are carried out in the coming three years. The Committee also recommends CERN to provide adequate support to the collaboration.

6.5 NA63

The SPSC is pleased to see the recent publications by the NA63 collaboration on the Landau-Pomeranchuk-Migdal effect in low-Z targets and on structured target resonances. The Committee notes the collaboration’s plans to study positron production in crystals, and bremsstrahlung and delta electron emission by Argon ions, and recommends that suitable beam time be allocated in 2015 to perform the measurements.

6.6 P349

The SPSC received with interest a proposal to search for polarization effects in the antiproton production process, SPSC-P-349.

The committee considers the physics case to be interesting and the proposal to be well prepared. The SPSC recommends the requested three weeks of beam time at the PS in 2014.

7. FOLLOW-UP ON EXPERIMENTS AND PROPOSALS

7.1 ACE

The Committee received with interest the request by the ACE Collaboration for beam time for a benchmark experiment in 2014. The Committee supports the request for 36
hours of beam to perform the experiment for a better understanding of the dose deposition of an antiproton beam in the ACE experimental setup.
The Committee urges the ACE collaboration to proceed with the analysis of all data sets towards a combined RBE value for antiprotons using the most recent version of the FLUKA simulation programme together with detailed descriptions of the beam intensity, beam profile and the experimental apparatus. The SPSC is looking forward to review the results in its next meeting.

7.2 BASE

The SPSC congratulates the BASE collaborators for the world leading and direct measurement of the proton’s magnetic moment using the double Penning trap method.

8. AOB

8.1 DATES OF THE SPSC MEETINGS IN 2015

The Committee agreed on the following dates for the meetings of the SPSC in 2015:

- Tuesday 14. April 2015 and Wednesday 15. April 2015;

9. DOCUMENTS RECEIVED

- DRAFT Minutes of the 113th meeting of the SPSC, Tuesday 8 April and Wednesday 9 April 2014, CERN-SPSC-2014-0XX, SPSC-113;
- Agenda of the 114th Meeting of the SPSC, Tuesday and Wednesday, 24-25 June 2014, CERN-SPSC-2014-021, SPSC-A-114;
- Search for polarization effects in the antiproton production process, CERN-SPSC-2014-016, SPSC-P-349;
- CLOUD status & long-term plans, CERN-SPSC-2014-018, SPSC-P-317-ADD-4;
- Status and plans for 2015, CERN NA63, CERN-SPSC-2014-019, SPSC-SR-138;
- Status report of the OPERA experiment, CERN-SPSC-2014-022, SPSC-SR-140;
- ICARUS report to the CXIV meeting of the SPS-C, CERN-SPSC-2014-023, SPSC-SR-141.

CERN Document Server (CDS):
http://cdsweb.cern.ch/search?sc=1&p=SPSC

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