

**MINUTES on the 111<sup>th</sup> Meeting of the SPSC**  
**Held on Tuesday 22 October and Wednesday 23 October 2013**

**OPEN SESSION**

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|----|---|--------------------|
| 1. | Status and plans of the NA61 experiment                               | Seweryn Kowalski   |
| 2. | Status and plans of the UA9 experiment                                | Stefano Radaelli   |
| 3. | Status and plans of the CAST experiment                               | Giovanni Cantatore |
| 4. | Letter of Intent for the International Axion Observatory (IAXO)       | Igor Irastorza     |
| 5. | Expression of Interest to search for heavy neutral leptons at the SPS | Andrey Goludvin    |
| 6. | Status and plans of the OSQAR experiment                              | Miroslav Sulc      |

**CLOSED SESSION**

Present:

S. Bertolucci<sup>1)</sup>, M. Diehl, R. Forty, L. Gatignon, A. Ianni, I. Irastorza, T. Lasserre, S. Maury, B. Panzer-Steindl, L. Ramello, C. Rembser (scientific secretary), E. Rondio, M. Rozanska, N. Severijns<sup>1)</sup>, F. Sikler, R. Thompson<sup>1)</sup>, C. Vallée (Chair), U. Wiedemann, H. Wilkens, M. Wing<sup>1)</sup>, I. Wingerter-Seez

<sup>1)</sup> Present on Tuesday only

Apologies: P. Collier, A. Jokinen, S. Schönert



1. MINUTES OF THE 110<sup>th</sup> MEETING OF THE SPSC HELD  
ON 25 JUNE AND 26 JUNE 2013

The minutes of SPSC110 were approved (CERN-SPSC-2013-021, SPSC-110).

2. CHAIRMAN'S REPORT FROM RB205

The Chairman reported on the Research Board (RB) meeting, RB205.

The following points were presented and, where necessary, discussed.

- 1) The SPSC presented the progress in the final analysis of the muon and hadron beam data recorded by the COMPASS experiment up to the year 2012, the first COMPASS Primakov physics results and the successful preparation of the future DVCS and Drell-Yan runs;
- 2) The Committee summarised the current OPERA results in electron and tau neutrino appearance, including observation of a third tau neutrino candidate, and stressed the importance of a strong support to the experiment in the coming years to allow full exploitation of their data set;
- 3) The SPSC presented the final data set collected by the ICARUS Collaboration and its updated limits on sterile neutrinos, and expressed its wish to see more physics results in the near future;
- 4) The results of the review of the AWAKE project were presented as well as recommendation for approval of the project, under the provision of an adaptation of the schedule to external constraints and production of detailed milestones to review the progress;
- 5) The SPSC presented the main features of the NuSTORM Expression of Interest and expressed its positive appreciation on the adequacy of the project with the European Strategy in neutrino matters. The Committee expressed the need for a more focused proposal to further review the project.

The Research Board noted points 1), 2), 3), 5) and endorsed point 4).

Following previous recommendations of the SPSC, the Research Board approved moving ICARUS to CERN and an associated R&D project involving a smaller state-of-the-art single phase Liquid Argon (LAr) detector (with experiment reference number WA104). The RB also approved an R&D project on double phase LAr Time Projection Chambers (with experiment reference number WA105). The approvals of both projects are conditional to timely productions of detailed R&D programme descriptions to be reviewed by the SPSC.

3. STATUS OF ACCELERATORS

S. Maury reported on the ongoing shutdown activities and summarised the current plan for the next five years for the operation of the CERN accelerators with ions.

At the Booster, the consolidation and maintenance work on the kicker and septa magnets, the beam stoppers, the vacuum instrumentation and the campaign to replace cables are progressing well. The work for a replacement of the beam dump has started. Special attention is needed on a vacuum leak on a wide-band pick-up, which developed during the summer. Recovery of the vacuum is expected for March 2014, in time for the closing of the

Booster in May 2014 to prepare for protons.

The shutdown work at the PS is on schedule. Tests of the new access system have started as well as the moving of the beam position monitors in the transfer line to the SPS. The consolidations of various types of magnets and a campaign to replace cables are ongoing. The activities at the SPS – the replacement of irradiated cables in the splitter area, the installation of new supports to reinforce the transfer line tunnel T10 to the North Area and the installation of a fibre optic system in one of the SPS support facilities BA5 – are on schedule to close the machine on 27 June 2014 to be ready for beam to the North Area on 13 October 2014.

At the AD the consolidation work and the preparations for ELENA are progressing well. For a part of the beam line, Line 7000, the procurement of the vacuum chamber material is in progress and the construction will start. The work to divide the AD target area into a number of sectors has been finished. This will allow easier access to individual parts of the target area.

At LEIR a number of sectors are currently prepared for a bake-out campaign from October until mid of November 2013. Also a new access system has been installed, all tests indicate that the system is working fine thus it will be put into service soon.

For the operation of the accelerators with ions, the current planning includes the following preparations and runs for lead, argon and xenon:

The commissioning of LEIR, PS and SPS with argon is scheduled for the second half of 2014.

From January until March 2015 the Ar run for the NA61 experiment with six different momenta is foreseen. Afterwards, in the remaining months of 2015, the accelerators will be re-commissioned for lead ions, followed by a lead-lead run for the LHC and primary lead ions to be sent to the North Area for the NA61 experiment.

Commissioning of the injector accelerators for xenon running is scheduled for the first half of 2016, followed by preparing and carrying through a lead run for the LHC and for the NA61 experiment at the end of 2016.

In the first months of 2017 the commissioning of the PS and SPS with xenon ions should take place, followed by two months of a Xe physics run of the NA61 experiment. After this run, in August until October 2017, the accelerators will be prepared for lead ions, followed by a proton-lead run for the LHC in November and December 2017.

#### 4. STATUS OF EXPERIMENTAL AREAS

L. Gatignon summarised the ongoing work in the experimental areas.

In the East Area the dismantling of the DIRAC experiment has been completed and the installation of the infrastructure and shielding for the new irradiation facilities is about to start. In parallel CLOUD has successfully started physics data taking without beam. The feasibility study for integrating a T11-like beam in the future layout of the East Area is well under way.

In COMPASS but in particular in the EHN1 experimental hall huge cleaning campaigns have taken place, also as both areas were visit points during the CERN Open Days.

In EHN1 a buffer zone for equipment as required by the Radio Protection service is now operational and all materials leaving the hall must pass through there. The users have received information on the procedures for this new facility.

In ECN3 the field of the MNP33 spectrometer magnet has been mapped, as well as the field

of the remanent magnetisation inside the iron decay tube. In spite of the non-availability of the beam control system over the shutdown, the magnet could be put in operation.

The planning for the consolidation and repair activities in the SPS splitter regions TCC2 and TDC2 is progressing. An ALARA Level3 meeting on 14 October 2013 approved the work, except for the cabling work that, as foreseen, will be addressed in a forthcoming meeting in spring 2014. This consolidation project addresses recurrent corrosion and vacuum issues in the splitter region as well as a decennial maintenance. About 160 persons will be involved on the worksite.

Some studies are continuing for an extension of the EHN1 hall to serve the WA104 and WA105 experiments with charged test beams. The presented ideas are still preliminary.

The AWAKE project has moved from a design study to the project phase.

It is aimed for finishing the installation of the facility by end of 2015 and to install the experiment, including hardware commissioning and a dry run, in the first nine months of 2016. Electron beam is planned for end 2017.

On the short term several integration aspects are being studied and the CNGS area is being prepared and cleaned for AWAKE.

The AD dipole magnet DR.BHN06 will be renovated as planned.

The ATRAP experiment is removing its positron source to create space for the magnet removal. The ATRAP collaboration is also emptying and disassembling their barrack to make space for the BASE installation. The installation of the BASE experimental equipment has already started. Also the installation of the AEGIS experiment is in progress. The construction of the new building outside the AD experimental hall has started in May 2013 and is now well under way.

## 5. PS AND SPS USER SCHEDULES

H. Wilkens presented the provisional injector accelerator schedules for 2014 and summarised the steps towards a users schedule for 2014.

In the schedules, the start of the physics run for the East Area is foreseen for 15 July 2014 and protons from the PS should be delivered for physics at the AD from 28 July 2014 onwards. The start of proton physics at the North Area is planned for 13 October 2014. PS and SPS will stop delivering protons for physics on 15 December 2014.

The user communities of the CERN injector accelerators were asked to submit their requests for beam time in 2014 until 15 December 2013. Draft users schedules for the PS, AD and SPS will be presented in the 112<sup>th</sup> meeting of the SPSC in January 2014.

## 6. DISCUSSION OF THE OPEN SESSION

### 6.1 CAST

The SPSC **is pleased** to see the impressive number of detector developments and improvements extending significantly the capabilities of CAST to search for axions, axion like particles as well as dark energy. The SPSC **supports** the CAST physics run in 2014 and **is looking** forward to seeing interesting new physics results.

## 6.2 OSQAR

The SPSC **acknowledges** the successful efforts by the OSQAR collaboration to acquire and operate a laser system for the 2013 run.

The Committee also **acknowledges** the progress achieved by the OSQAR collaboration in building and exercising Fabry-Perot cavities and **encourages** further development. The committee **recognises** that this is also a step in preparing a measurement of the vacuum magnetic birefringence. The SPSC recommends **support** of the 2014 run for which an improved sensitivity for axion searches by coupling the laser to a Fabry-Perot cavity is expected.

## 6.3 NA61 (SHINE)

The SPSC **congratulates** the NA61 Collaboration for the successful completion of the beryllium-on-beryllium data taking and the timely presentation of first results.

The committee **acknowledges** the progress in the analysis and publication of the results of reference pp data and data relevant for neutrino and cosmic ray physics.

## 6.4 NA63

The Committee **notes with satisfaction** the publication of the analyses on structured target resonance and quantum suppression.

The committee **acknowledges** the progress made in understanding and preparing the experimental setup for positron production in crystals including the MIMOSA detectors.

The Committee **is looking forward** to the proposal of the setup for the requested 2014 data taking.

## 6.5 UA9 (CRYSTAL)

The SPSC **notes with pleasure** the further progress made by the UA9 Collaboration in the detailed planning for the LHC test and in publishing results from the SPS data taking.

The SPSC **recommends** that efforts be made to allocate suitable SPS beam time in 2014 to allow for the further testing of goniometers and Cherenkov detectors.

## 6.6 LOI242 (IAXO)

The Committee **received with interest** a Letter of Intent SPSC-I-242 for an International Axion Observatory, a fourth generation axion helioscope. The SPSC will **further review** the project.

## 6.7 EOI010

The Committee **welcomes** the received Expression of Interest SPSC-EOI-010 to search for Heavy Neutral Leptons in the decays of charm mesons using the SPS beam.

The SPSC **will further review** the project.

## 7. A.O.B

### 7.1 ANNUAL REVIEWS IN 2014

In 2014 the SPSC will review the experiments on the following dates:

- 14 January and 15 January 2014: ATRAP, ASACUSA, ACE, ALPHA, BASE;
- 8 April and 9 April 2014: WA104, WA105, NA62, AEGIS, GBAR, RD52;
- 24 June and 25 June 2014: COMPASS, OPERA, ICARUS, CLOUD, DIRAC;
- 21 October and 22 October 2014: NA61, N63, UA9, CAST, OSQAR, AWAKE.

## 8. DOCUMENTS RECEIVED

- Minutes of the 110th meeting of the SPSC, Tuesday 25 and Wednesday 26 June 2013, CERN-SPSC-2013-021; SPSC-110;
- The International Axion Observatory IAXO, CERN-SPSC-2013-022; SPSC-I-242;
- Proposal to Search for Heavy Neutral Leptons at the SPS, CERN-SPSC-2013-024; SPSC-EOI;
- Status and plans for 2014, CERN NA63; CERN-SPSC-2013-025; SPSC-SR-122;
- Status and plans of the NA49 pp/pA group; CERN-SPSC-2013-026; SPSC-M-781;
- Status report of the CAST Experiment, planning and requests for 2013-2014; CERN-SPSC-2013-027; SPSC-SR-123;
- Report from the NA61/SHINE experiment at the CERN SPS; CERN-SPSC-2013-028; SPSC-SR-124;
- Status and further Analysis Plans of the NA49 Collaboration; CERN-SPSC-2013-029; SPSC-M-782;
- OSQAR Annual Report 2013; CERN-SPSC-2013-030; SPSC-SR-125;
- UA9 Report for 2013; CERN-SPSC-2013-031; SPSC-SR-126;
- Updated sensitivities for the discovery of the neutrino mass hierarchy and of CP-violation in the leptonic sector of a very-long baseline neutrino oscillation experiment at 2300 km from CERN; CERN-SPSC-2013-032; SPSC-M-783.

CERN Document Server (CDS):

<http://cdsweb.cern.ch/search?sc=1&p=SPSC>