

CERN/SPSC 2000-018  
SPSC 47  
17.04.2000

## SPS AND PS EXPERIMENTS COMMITTEE

Decisions taken at the 47th meeting held on 28 and 29 March 2000

### OPEN SESSION

1. Status report on NA45: J. Wessels
2. Status report on NA49: P. Seyboth
3. Status report on NA50: L. Kluberg
4. Status report on NA52: R. Klingenberg
5. Status report on NA53: J. Hill
6. Status report on NA57: V. Manzari
7. Study of Prompt Dimuon and Charm Production with Heavy Ion Beams at the CERN SPS (SPSC 2000- 010/P316): C. Lourenço

### CLOSED SESSION

Present: F. Bobisut, W. Braunschweig, M. Cavalli-Sforza, S. Dalla Torre, Y. Déclais, J.-P. Delahaye, A. De Roeck, C. Détraz, R. Forty, G. Goggi, P. Grafström, U. Heinz, K. Hübner, J. Knobloch, B. Koene, K. Königsmann (Chairman), W. Kühn, A. Magnon, J. May, S. Myers\*, N. Pavlopoulos, M. Pennington, A. Pich, T. Ruf, H. Taureg (Secretary), D. Websdale, A. Zalewska

\* Part-time

Apologies: J-P. Riunaud

#### 1. INTRODUCTION

The Chairman welcomed a new member of the Committee, F.Bobisut from Padova.

#### 2. APPROVAL OF THE MINUTES

Under 6.3 'Status report of ASACUSA' , page 4 of the minutes, the sentence starting in line 6 should read: The aim of phase 2 has been concentrated on high precision spectroscopy of antiprotonic helium, antiprotonic atom formation and dE/dx measurements.

The minutes of the 46th SPSC meeting (SPSC 2000-007/ SPSC 46) were approved with the above amendment.

3. REPORTS FROM THE 145<sup>th</sup> MEETING OF THE RESEARCH BOARD

The Research Board concurred with the congratulations to the PS Division for the achievements in the AD commissioning. The Board approved phase 2 of the ASACUSA experiment and noted the request to clarify the phase 3 physics program.

The Research Board approved the repair of the NA48 spectrometer.

The Research Board approved P315/HARP for their phase 1 program on the understanding that the running in the building 157 must be finished by the end of 2001. The experiment will be known as PS214.

Further technical issues have to be resolved before considering an approval of P312/SATAN.

4. STATUS REPORT ON THE SPS

P. Grafström reported on the shut down work at the SPS and commented in more detail on work in progress.

Installation of an impedance shield at about 1000 pumping ports requires removal of every second dipole in the machine. This work will be finished in the next shutdown.

Target T1 and the H3 beam line have been displaced to make room for the injection line towards point 2 of LHC.

The excavation of the service cavern USA15 at point 1 of LHC caused sagging of the SPS tunnel by about 5 mm and the machine had to be realigned over about 200m. A lot of dust was distributed in the former UA2 cavern when a service tunnel was connected to the cavern and a lot of equipment for the SPS had to be cleaned.

The start up of the machine is under way. Leptons have been accelerated to 22 GeV and extracted. Protons have been accelerated to 450 GeV with standard optics.

5. STATUS REPORT ON THE PS

J.-P. Delahaye reported on the status of the PS. A new cavity has been installed for LHC. The beam line to the nTOF facility has been completed. Several improvements have been implemented for the AD. However, a vacuum leak at a kicker will delay beams in the AD by about one week.

The technical ISOLDE group will join the PS Division as of 1 April 2000.

The Committee was impressed by the amount of work done during the shutdown both on the SPS and the PS machine.

6. STATUS OF THE EXPERIMENTS

T. Ruf commented on a number of "space" experiments related to cosmic ray physics which will use test beams at the PS and SPS this year. AMS and PAMELA are recognized experiments. GLAST has requested to become a recognized experiment. ACCESS and AGILE have made no such request.

7. STATUS REPORT ON NA45

The referee explained the problems NA45 encountered with the read-out system in 1999 when running with ion beams. The problem affected mainly the TPC read-out and led to substantially fewer data collected than expected. The good performance of the RICH and silicon drift detectors in 1999 should allow better background rejection. One should expect similar quality of results from the 1999 data as from the 1995 and 1996 data sets.

For the run this year the TPC read-out system is being changed based on a design for ALICE and used by NA49. The schedule is tight. The 2000 data should allow a good look at the mass spectra of individual vector mesons.

The Committee took note of problems with the DAQ of the experiment. The Committee expressed its hope for a successful modification of the read-out and anticipates a good run in the year 2000.

8. STATUS REPORT ON NA49

The status of NA49 and the addendum to the proposal will be discussed at the next meeting.

9. STATUS REPORT ON NA50

NA50 has observed a larger than expected suppression of  $J/\psi$  as function of energy density. This is interpreted as evidence for the deconfinement of quarks and gluons in Pb-Pb collisions. The experiment has no useful acceptance at 40 A GeV/c beam energy. Therefore no physics data were collected in the 40 A GeV/c run in 1999. But very successful tests were conducted with a new target box which will be employed this year. This year's run will study the suppression of  $J/\psi$  in more detail.

The Committee congratulated the collaboration on the analysis of the 1996 to 1998 data and the exiting results on  $J/\psi$  suppression.

10. STATUS REPORT ON NA52

The experiment has successfully completed data taking and has been dismantled. Data from 1994 and 1995 have been fully analyzed and published. The 1998 data have been partially analyzed and preliminary results have been shown at conferences. It is expected that all data are analyzed by the end of the year and results will be shown at the beginning of 2001.

The experiment has not found strangelets but significant upper limits for their production have been established. A large data set has been obtained on production of hadrons and a few light nuclei.

The Committee congratulated the collaboration on the very successful completion of the experiment and the results on the strangelet search. The Committee looks forward to the completion of the analysis and recommends comparisons of the data with other experiments.

11. STATUS REPORT ON NA53

The experiment has completed data taking. Preliminary results have been published on the 1998 data and the 1999 data are being studied. Final results are expected for the beginning of 2001.

The obtained cross-sections on electromagnetic dissociation contain no surprises and allow a safer extrapolation to RHIC and LHC energies. The results are important for the estimation of beam lifetimes in these machines.

The Committee congratulated the experiment for the successful completion.

12. STATUS REPORT ON NA57

The experiment aims to study QGP formation using strangeness production as a probe. Data have been taken in 1998 and 1999. First results from the 1998 data are expected this summer and pilot production of the 1999 data has started. Because of problems with the wafer production and bonding the multiplicity pixel detector has been abandoned.

The Committee took note of the successful data taking and looks forward to the results of the 98 data by summer 2000 with an extended centrality range.

13. 80 A GeV/c RUNNING

The Committee awaits complete analysis of the 40 A GeV/c data and their comparison with the 158 GeV data before considering the request for an 80 A GeV/c run.

14. GOALS AND PERSPECTIVES OF AN OPEN CHARM PROGRAM WITH HEAVY IONS AT THE SPS

U. Heinz explained which questions can be addressed by the study of charm production in hadron-hadron, hadron-nucleus and nucleus-nucleus collisions. Charm production in nucleus-nucleus collisions is a direct probe of the early collision stage and thus of the quark-gluon plasma. Measurements on open charm production in nuclear collisions provide a test of perturbative QCD in a nuclear medium, give access to gluon distribution functions, are a tool to study parton interactions in confined matter and are the best reference for  $J/\psi$  production. pp and pA studies are required as reference. The advantage of AA collisions at SPS energies is that secondary production is suppressed and thus they provide a cleaner situation than at higher energy machines. AA collisions at the SPS are an important reference for RHIC and LHC.

15. P316: STUDY OF PROMPT DIMUON AND CHARM PRODUCTION WITH PROTON AND HEAVY ION BEAMS AT THE CERN PS

The experiment wants to measure dimuon production above a dimuon mass of about  $0.5 \text{ GeV}/c^2$ . Substantially higher statistics and much better mass resolution are expected compared to present experiments. The contribution of open charm will be determined by looking for secondary vertices as origin of the muons. The contribution of open charm is not known experimentally today and is an important ingredient for understanding  $J/\psi$  production. The collaboration proposes to modify the NA50 set-up by adding tracking detectors upstream and downstream of the target. By measuring the incoming projectile track and the outgoing tracks after the target secondary vertices can be found and thus prompt and non-prompt charm production can be separated. Silicon detectors will be used which are being developed for LHC. Prototype tests in the NA50 set-up gave good results.

The Committee considered the physics program as interesting and important for the understanding of the QGP dynamics. The Committee recommends the proposal for approval pending clarification of several technical topics: availability of working "ALICE" chips, feasibility of ion beams with mass number around 100, available resources for computing and, perhaps, operating the SPS for a single ion experiment.

16. STATUS REPORT ON NA59

In December 1999 the collaboration presented a model dependent measurement of the photon polarization from the determination of the pair production asymmetry. The model independent  $\rho^0$  analysis is progressing but  $\rho^0$  polarization has not yet been demonstrated.

The Committee requests a further status report for its May meeting. Nevertheless, the Committee grants four weeks of beam time this year and requests a repetition of the  $\rho$  polarization measurement with this year's data.

17. ADDENDA 2 and 3 to NA48 (P253)

Addendum 2 to NA48 proposes to search for rare  $K_s^0$  and neutral hyperon decays. The experiment will allow new and interesting checks of chiral perturbation theory and CP violation. The Committee recommends for approval phase 1 of the program which will take place in 2000. Phase 2 of the program will be considered after study of the proposed experimental technique.

Addendum 3 to NA48 proposes to study CP violation and chiral symmetry in charged kaon decays. From the physics point of view the program seems worthwhile and promises improvements over other, ongoing experiments. The Committee will consider the proposal after detailed study of the proposed experimental technique and detector upgrades.

18. MACHINE SCHEDULES

T. Ruf reported on the schedule of the machines and the beam time distribution. At the SPS several tests of ATLAS and CMS have been cancelled. To a large extent the beam time will be used by other groups.

The energy and cycle of the SPS will be modified during the year. Until 12 July the SPS will run at 450 GeV with a 2.4s spill and 14.4s cycle. From 12 July onwards the energy will be reduced to 400 GeV and the spill increased to 3.2s keeping the cycle length. Next year the energy will be 400 GeV and the spill/cycle will be changed to 5.3s/16.8s which increases the duty cycle by 80%. Overall expenditure will increase by 360 kCHF for the two years.

19. A.O.B.

The CosmoLEP group wants to install and operate a test set-up in LSS4. In view of the duration of the planned test the Committee asked for more detailed information, a proposal, from CosmoLEP before considering the request.

## 20. DOCUMENTS RECEIVED

Addendum 5 to proposal P264: Status and Future Programme of the NA49 Experiment (CERN/SPSC 2000-011/P264 Add.5).

Proposal: Study of Prompt Dimuon and Charm Production with Proton and Heavy Ion Beams at the CERN SPS (SPSC 2000-010/P316).

A solar axion search using a decommissioned LHC magnet (Proposal P312): (CERN/SPSC 2000-008/M644).

OPERA Status Report (CERN/SPSC 2000-012/M645).

Recent results from the NA52 experiment (CERN/SPSC 2000-014/M647).

Progress report on the NA59 experiment 1999 data analysis (CERN/SPSC 2000-015/M648).

Experiment NA53 Progress Report (CERN/SPSC 2000-017/M649).

Installation of a test set-up in LSS4 (CERN/SPSC 2000-019/M650).

Status of the CERES/NA45 experiment and plans for 2000 (CERN/SPSC 2000-009/M651).

Experiment NA57 - Offline Activity Report (CERN/SPSC 2000-020/M652).

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