EUROPEAN LABORATORY FOR PARTICLES PHYSICS

CERN/SPSC 97-29
SPSC 35
11 November 1997

SPS AND PS EXPERIMENTS COMMITTEE

Decisions taken at the 35th meeting on 28 October 1997

OPEN SESSION

Atomic spectroscopy and collisions using slow antiprotons (ASACUSA Collaboration; SPSC 97-19/P307) : R.S. Hayano

Status report from DIRAC [PS212] : L. Nemenov

CLOSED SESSION

Present: P. Bagnaia, W. Braunschweig, M. Cavalli-Sforza, B. D'Almagne (Chairman), D. Drijard* (Secretary), L. Foà, B. Gavela, G. Goggi, P. Grafström, K. Green, J.-F. Grivaz, K. Hübner, K. Jakobs, K. H. Kissler, B. Koene, R. Landua, M. Neubert, A. Norton, M. Pennington, J.-P. Riunaud, D. Simon, J. Stachel, E. Tsesmelis*, M. Turala, G. Wilquet*, A. Zalewska.

* part-time

Apologies: J.-P. Blaizot, K. Königsmann, L. Ristori, M. Tyndel.

1. Approval of the minutes:

The minutes of the 34th meeting were approved without modifications.

2. Report on the meeting of the Research Board:

Two issues were brought to the attention of the Research Board at its June meeting by the SPSC. The strategy for future neutrino experimentation relying on a single new beam to be directed towards the Gran Sasso laboratory, with a close detector pit for a possible short base-line experiment was endorsed by the Research Board as scientifically very important and worth pursuing. The board strongly encouraged the current efforts towards its realisation. A technical study group with INFN participation was to be set up soon. Secondly two proposals were submitted at the Antiproton Decelerator (AD) for experiments aimed at precision spectroscopy of antihydrogen: ATHENA (P302) and ATRAP (P306).

These two proposals were approved and will have respectively the code numbers AD1 and AD2. The Research Board approved at its September meeting the COMPASS [NA58] experiment, after its funds had been granted.

3. Status report on the SPS:

The SPS had resumed its operations at the end of July and had reached its full intensity, as it was before the accident, in an appraised speedy way after being stopped for about 80 days. Altogether the number of protons delivered on targets will probably exceed that obtained in 1995 while remaining somewhat lower than in 1996. A new record of $4.8 \cdot 10^{13}$ protons accelerated at 440 GeV had been attained with $5 \cdot 10^{13}$ being within reach. The committee congratulated the teams involved for their very good achievements.

4. Status report on the PS:

The PS complex had seen extremely good conditions, reaching an unprecedented low fault rate below 6%. Record intensities were achieved, some 7% above the last record. The congratulations of the committee to the SPS were to be shared by the PS teams whose achievements are an integral part of the overall good results.

5. Status report on SPS and PS experiments:

The co-ordinator reviewed the status of the experiments since the last SPSC. Both neutrino experiments were especially pleased by the results of the measures taken after the fire. The number of protons-on-target delivered was already slightly higher than in 1996, indicating a probable increase for the whole of 1997 of some 15%. CHORUS was running smoothly and taking data with high efficiency. NOMAD was running with its complete detector for the third year, and had used an instrumented silicon target, STAR, since the beginning of 1997. The liquid Argon TPC (SPSLC 96-57/M594) placed in front of NOMAD had taken data continuously from the restart of the SPS. NA48 had collected this year 650,000 $K_L \rightarrow 2\pi^0$, a sample comparable to that of NA31 in three years. NA49 had used various beams and targets to study proton-nucleus interactions, attaining an efficiency improved from previous years. NA50 had taken reference data and done technical tests. PS211 had completed their final checks; the data collection is now completed.

6. Discussion of the open session:

6.1 ASACUSA (PS307):

The committee considered the experiment as a natural complement to the successful programme achieved by PS205 at LEAR, of great interest for atomic physics and with valuable feedbacks on theoretical calculations. The important experience gained at LEAR by the teams involved will be directly applicable and the infrastructure requirements appear realistic. For these reasons, the committee recommended for approval to the Research Board the first phase of the experiment. It consists of „He^+ laser and microwave spectroscopy at high resolution of the hyperfine structure –mostly spin-orbit effects– using a „ beam at 5.8 MeV. The committee further encouraged the development of an RFQ decelerator in partnership with the PS Division. The scientific programme making use of this equipment will be considered in due time.

6.2 DIRAC (PS212):

The committee was satisfied with the progress of the collaboration in the detector construction. However it noted that the installation schedule is tight, and that careful co-ordination and the presence at CERN of substantial manpower from the collaboration will be needed to begin commissioning the detector in September 1998.

7. Memorandum from NOMAD:

The collaboration had requested an additional run of five months in 1998 (SPSC 97-18/M600). This would essentially increase the sensitivity in the channel $\nu_\mu \rightarrow \nu_\tau$ by about 50% and, in addition, the charm statistics in the target STAR would be doubled. The committee recommended this extension to the Research Board. However it stressed that a failure of the ν-beam would be impossible to correct and would imply the termination of the run.

8. Discussion of the Letters Of Intent:

8.1 I216 and I217:

Letter I216 considers the use of a neutrino beam derived from the PS proton beam to perform an experiment checking for a $\nu_\mu \rightarrow \nu_e$ oscillation in the range of parameters open by the signal claimed by the LSND experiment.

Letter I217 recalls the possibility of a medium base-line experiment using the present SPS west beam-line and a detector located 17 km away, behind the Jura. It would cover approximately the same mass range as the PS beam project, but would also be sensitive to ν_μ -> ν_τ oscillations.

These projects, which have their own scientific interest, are clearly incompatible with the development of the long base-line neutrino beam. They could be reconsidered only in case of impossibility to get this new beam.

8.2 OPERA (I218):

This neutrino-oscillation experiment would run at the Gran Sasso with an emulsion detector. The committee found the idea appealing and encouraged the team to study the feasibility of this detector.

8.3 I219:

This experiment aims at a search for free quarks in heavy-ion interactions. The committee identified some difficulties, in particular the request for a bunched beam which is incompatible with other experiments and thus did not encourage the group to submit a proposal.

9. Schedules of the machines:

The co-ordinator showed the draft schedule of the SPS, though it was not yet discussed with the users. He indicated that there is not much spare time left for late requests. The X7 beam-line in the West Area will be upgraded to 250 GeV/c. The temporary prolongation of the X7 line for CHORUS in 1998 was approved.

There were various requests for irradiation runs in the upgraded PS East Hall. A first primary proton zone, an area in the upstream part of T7, could accommodate requests from ATLAS, CMS and RD48 to irradiate silicon and pixel detectors. A second zone, inside the beam dump downstream of DIRAC, would allow studies of silicon and pixel structures behaviour requested by RD48 to be done in parallel with DIRAC. Both zones would use a remote-controlled shuttle passing through the shielding. The co-ordinator recommended the approval of these two zones. Two further irradiation runs were asked for on the T8 beam downstream of DIRAC. First the request from RD48 for proton tests was recommended to be performed in the first zone mentioned above, thus avoiding difficulties with the DIRAC operations. Secondly a request had been submitted by ATLAS for a neutron irradiation of a liquid Ar tank. Given the present design of the shielding and the concerns, albeit qualitative, raised by DIRAC on possible damages to the closest part of its detector, such a facility was at present not recommended. Solutions were being actively sought. The committee followed the recommendations of the co-ordinator.

10. Any other business:

The committee received a memorandum from ATLAS (SPSC 97-27/M602) concerning special running periods of the SPS with a 25ns bunch structure. This question will be considered at a later meeting, following a report from the SPS team.

The 36th meeting will be held on **Tuesday 20** and **Wednesday 21 January 1998**

The 37th meeting will be held on **Tuesday 24** and **Wednesday 25 March 1998**

D. Drijard