CERN/SPSC 2001-007
SPSC 51
13 February 2001

SPS AND PS EXPERIMENTS COMMITTEE

Decisions taken at the 51st meeting held on 23 January, 2001

OPEN SESSION

1. Status report on AD-1, ATHENA: R. Landua
2. Status report on AD-2, ATRAP: G. Gabrielse
3. Status report on AD-3, ASACUSA: R. Hayano
4. Measurement of the ELastic AntiProton Proton Cross Section at AD – ELAPP (SPSC 2001-002/P320): T. Bressani
5. A COsmic RAy experiment in and above the LHC tunnel – CORAL (SPSC 2001-003/P321): K. Eggert

CLOSED SESSION

Present: H. Bialkowska, F. Bobisut, W. Braunschweig, I. Brock, M. Cavalli-Sforza, S. Dalla Torre, M. De Jong, A. De Roeck, J-P. Delahaye, C. Détraz, E. Fernandez, R. Forty, G. Goggi*, P. Grafström, M.Hauschild, K.Hübner, B. Koene, K. Königsmann (Chairman), W. Kühn, A. Magnon, J. May*, A. Norton*, N. Pavlopoulos, M. Pennington, A. Pich , J-P. Riunaud, T. Ruf, H. Taureg (secretary), D.Websdale.

* part time

Apologies: Y. Déclais, U. Heinz, J. Knobloch, S. Myers, A. Zalewska

1. APPROVAL OF THE MINUTES OF THE LAST MEETING

The last sentence of point 14 should read: The Committee will consider the addenda to WA103 after data have been analyzed including a drift chamber reconstruction.

The minutes of the 50th meeting were approved with the above amendment.

2. REPORT FROM THE 150th MEETING OF THE RESEARCH BOARD

The chairman reported on the last meeting of the Research Board. The Research Board approved the addenda 2 and 3 of NA48. The experiments will be known as NA48/1 and NA48/2 respectively. The Research Board approved the ion programme of NA60 under the condition that the lead run takes place in 2002 and the indium run in 2003. The Research Board approved a 4 week run of NA49 with proton beams in 2001. The Research Board awaits results from the $\pi\pi$ atom analysis of DIRAC before considering the πK proposal.

3. STATUS OF THE SPS

P. Grafstrom reported on the activities during the long shut-down of the SPS. The work is related to preparations for LHC (matching of PS and SPS, changes in injection and extraction, reduction of impedance), removal of LEP related equipment, civil engineering for LHC and modifications in services (cooling water circuit, electrical network, elevators). In addition there is the normal shut-down work (replacement of irradiated cables, realignment of all magnets).

4. STATUS OF THE PS

J.-P. Riunaud recalled the performance of the PS and AD machines in 2000. He mentioned the shut-down work on the PS and concentrated on the AD activities. Repair-work in the AD is under way on the vacuum leak of kicker 50 and on strengthening the support of all quadrupole coils. A bake out is planned of 3/4 of the ring. The Faraday cage will be installed for the ASACUSA RFQD power amplifier. The objectives for 2001 are a substantial reduction of the fault rate, a fast change over between the AD experiments, and reaching a "cruise" regime for the machine operations. Beams for physics are scheduled for 3000 h from Mondays to Fridays without weekend running. It will be very difficult to accommodate any new experiment or machine development.

5. STATUS OF AD-1, ATHENA

The referee reported on the status of the experiment. The apparatus for antihydrogen production and detection is in place. The $\overline{H}$ detector is working. Antiprotons have been trapped and cooled and positrons have been accumulated and transferred to the recombination trap. Antihydrogen production in 2001 requires a substantial improvement of the vacuum in the $\overline{p}$ trap and an increase in the number of $\overline{p}$ and e+ trapped. The collaboration should invest more effort in the preparation of magnetic and nested traps for the next phase of the experiment in order to avoid possible delays.

The Committee congratulates the collaboration on the progress made in the setting up and testing of the detector during the year 2000 and the trapping of $\overline{p}$ and e+. The Committee anticipates the detection of antihydrogen atoms in the forthcoming run and the preparation of traps for the next phase of the experiment.

6. STATUS REPORT ON AD-2, ATRAP

The referee reviewed the work of the ATRAP collaboration. Antiprotons have been trapped, stacked and cooled. Simultaneously cold positrons have been accumulated at a very large rate using a novel technique and have been made interact with the antiprotons. The $\overline{H}$ detector is not yet complete. Preparations for a second generation experiment are well under way.

The Committee **congratulates** the collaboration on the impressive progress in simultaneously stacking antiprotons and accumulating positrons and **looks forward** to the detection of antihydrogen atoms with a working crystal detector.

7. STATUS REPORT ON AD-3, ASACUSA

The referee summarized the achievements of the ASACUSA collaboration. The phase 1 of the experiment covered high resolution spectroscopy of antiprotonic helium. The bandwidth, precision and stability of the laser system allowed the discovery of 3 new resonances, improved precision measurements of 6 laser transitions and the detection of a microwave-induced resonance between hyperfine levels. This led to an improved limit on the charge difference between p and $\bar{p}$. After commissioning of the RFQD first dE/dx measurements of $\bar{p}$ in carbon and gold below 60 keV have been completed showing the expected 'frictional' loss.

The Committee **congratulates** the collaboration on the detection of new transitions, the measurement of energy loss at low momenta and the measurement of hyperfine splitting. The Committee expects a detailed update on the envisaged physics programme of phase 3 in due time.

8. PROPOSAL P321/CORAL

The referee informed the Committee about the developments leading to this proposal. The Committee discussed various aspects of the proposal and formulated a number of questions concerning many topics like the scope of the proposal, detector performance and organizational matters.

The Committee will consider the proposal after clarification of a number of questions posed.

9. PROPOSAL P319/STRAD

The Committee heard external advice on the proposed measurements and discussed the implications of the proposal for the AD machine and the approved experiments

In view of the limited number of $\bar{p}$ from the AD, the Committee **cannot recommend** a programme to map out antiproton annihilation cross sections on nuclei.

10. PROPOSAL P320/ELAPP

The Committee considered the physics motivation, the experimental technique of the proposal and the consequences for the approved AD programme. The dip in the anti-nucleon annihilation cross section and other reaction anomalies, mentioned in the proposal, seem interesting. However, a study of only the antiproton proton elastic scattering events at low energy does not seem sufficient to prove new physics in this threshold region.

Therefore the Committee **does not recommend** this proposal.

11. BEAM REQUEST FROM NA57

The referee reviewed the available data sets of WA97 and NA57 and explained the limitations posed by the small pBe data sample at 40 GeV.

The Committee recognizes the physics interest in additional reference data and **asks** for studying ways to accommodate the beam request.

12. SPS AND PS SCHEDULES

The SPS and PS coordinator commented on the schedule for 2001. In the East hall the test beam time is very tight with the run by HARP in the T9 beam line. The distribution of proton cycles will change often to make best use of the available protons. At the AD the three experiments will organize the sharing between themselves. The LPI will stop end of April. The SPS will run at 400 GeV with a cycle of 16.8 sec and a flat top of 5.0 to 5.2 sec giving a 80 % higher duty cycle than in the past. The challenge will be to have about twice the number of protons in the machine compared to the past.

13. DOCUMENTS RECEIVED

Measurement of the ELastic Anti Proton Proton Cross Section at AD (SPSC 2001-002/P320).

CORAL: A Cosmic Ray experiment in and above the LHC tunnel (SPSC 2001-003/P321).

Request for a run in 2001 with a secondary positive beam at 40 GeV/c (SPSC 2001-005/M660).

AD-3 / ASACUSA Status Report (SPSC 2001-006/M661).

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