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CM-P00046015

PH III-72/39
30 March 1972

PHYSICS III COMMITTEE

DRAFT MINUTES OF THE MEETING OF THE
PHYSICS III COMMITTEE

HELD ON

15 MARCH 1972 AT 2.30 p.m.

PRESENT

Baarli, J.	CERN	Kofoed-Hansen, O.	CERN
Backenstoss, G.	Karlsruhe	Leisi, H.J.	ETH Zurich
Bailey, J.M.	Nina Daresbury	Lynen, U.	Heidelberg
Binon, F.G.	IISN Belgique	Michaelis, E.G.	CERN
Boschitz, E.T.	Karlsruhe	Nielsen, O.B.	Copenhagen
Brandt, R.	Marburg	Otten, E.	Heidelberg
Cernigoi, C.	Trieste	Ritter, H.G.	Heidelberg
Cox, C.R.	CERN	Roeckl, E.	Darmstadt/CERN
Daniel, H.	Munich	Rohlin, J.	Göteborg
Domingo, J.J.	CERN	Schmid, C.	CERN
Duclos, J.D.	Saclay	Schmitt, H.	Munich
Engelhardt, H.D.	Karlsruhe	Schött, W.	CERN
Engfer, R.	SIN/CERN	Serre, C.	IN2P3 Grenoble
Faessler, M.A.	Heidelberg	Spighel, M.	IPN Orsay
Favier, B.	Genève	Stroot, J.P.	IISN Belgique
Gabathuler, K.	ETH Zurich	Tanner, N.W.	Oxford
Gorini, G.G.	Pisa	Vaucher, B.	Lausanne
Hagebö, E.	Oslo	Walter, H.K.	SIN/CERN
Hahn, B.	Berne	Werren, D.W.	Genève
Herz, A.J.	CERN (Secretary)	Westgaard, L.	CERN
Hess, R.H.	Genève	Wilkin, C.	UCL London
Hilscher, H.	Munich	Wilkinson, D.H.	Oxford (Chairman)
Hofer, H.	Berne	Zakrzewski, J.	Warsaw
Jansen, J.A.	CERN	Zavattini, E.	CERN
Joseph, C.	Lausanne	Zupančič, Č.	Munich

1. MINUTES OF THE MEETING OF 26 JANUARY 1972 (PH III-72/24). MATTERS ARISING

Concerning the plans for the meeting of 16 and 17 March (point 4, page 2 of the minutes), Wilkinson reported that, following the opinion expressed by the Committee that one of the summarizers should be an experimentalist, C. Rubbia had been invited to give one of the summary talks and had accepted.

Michaelis pointed out that there was a misleading misprint in the report on the status of the SC Improvement Programme (point 7, page 4). The sentence starting in the 10th line from the bottom of the page should read: "These cones have now been manufactured...".

There being no other comments or corrections the minutes were approved.

2. REPORT ON DECISIONS MADE BY THE NPRC

Wilkinson reported that the Committee's recommendation concerning Experiment P9 by the Torino group (see PH III-72/24) had been discussed by the Nuclear Physics Research Committee who had decided to defer a decision on allocating running time in the k_{12a} beam until there was evidence that the tests in the t_1 beam were successful.

The Committee's recommendation (see PH III-72/24) concerning Experiment P11 by the Heidelberg group (high-resolution spectroscopy of hypernuclei; PH III-71/23, 72/1) had been referred by the NPRC to the Electronic Experiments Committee for discussion of possible interference with the EEC programme. However, the EEC had not yet made their programme for 1973, so that they could not say whether there would be difficulties. The NPRC had then requested that Povh et al. (Experiment P11) and Backenstoss et al. (Experiment P7) discuss and submit a programme for the utilization of beam k_{17} , and that they should attempt to arrive at a beam lay-out that would satisfy the requirements of both experiments.

Wilkinson pointed out that the work on X rays from exotic atoms (Experiment P7, Backenstoss et al.) had not received a time allocation in beam k_{17} except for tests. The report on these tests would probably be ready well before the next meeting of the Physics III Committee, and it would be important to make a recommendation to the NPRC at that time. He suggested that the Committee empower him to do this without further consultation, the general lines of the programme for Experiment P7 having been considered already.

The Committee agreed.

3. REPORT ON THE STATUS OF THE SC IMPROVEMENT PROGRAMME

Michaelis presented the following report:

The present status of the work on the SC Improvement is summarized in document PH III-72/36, section 5.

The essential new information since the last meeting is that the rotor, completely assembled with its own drive, bearings and supplies has now operated successfully in vacuum well above its design speed and has shown neither appreciable vibrations nor distortions of the blades of which there had earlier been some evidence. This means that the manufacture of the stator blades to their definitive dimensions can now go ahead.

Simultaneously the remaining components of the rotary-condenser system are being prepared and vacuum-tested.

Since the last meeting of this Committee there has therefore been substantial progress, but we do not expect to be able to make a decision on the shut-down date before July.

The one-week shutdown following the Easter holiday will therefore be necessary and has been scheduled.

4. REPORTS ON EXPERIMENTS AT THE SC. MACHINE-TIME REQUESTS FOR EXPERIMENTS IN PROGRESS

Wilkinson announced that as the shut-down for the SC Improvement Programme could not start before July, the Committee would be asked to pass recommendations for allocations of machine time for May and June.

Engfer, the SC Coordinator, then discussed the status of the SC programme and explained the changes he had had to make, for technical reasons, in the programme for the period 1.1.72 to 30.4.72 as recommended by the Committee on 26 January 1972 (see PH III-72/24) and approved by the NPRC (these changed allocations are listed in Table 1). He discussed the requests for machine time the groups had made for the period 1.5.72 to 30.6.72 and pointed out that they exceeded the time available by a considerable margin. He asked the Committee to recommend allocations lower than requested for some experiments; in the cases of some others he proposed that further runs be postponed until after 30 June when the SC might still be operating for a short time at least. The situation is summarized in Table 1; for details of the experiments listed see Table 2.

TABLE 1

Machine-time requests, allocations and Coordinator's proposals
for SC Experiments
(Sharing: (N) on neutron side, (P) on proton side)

Experiment code	1.1.72 to 30.4.72		1.5.72 to 30.6.72	
	Recommended 26.1.72	Scheduled as of 15.3.72	Requested	Coordinator's proposal
SC 2a	30 (N)	7 (N)	35 (N)	35 (N)
SC 4a	10	12	5	5
SC 9	-	-	6	postpone
SC 11	42 (N)	56 (N)	30 (N)	postpone
SC 19b	65 (N)	62 (N)	60 (N)	43 (N)
SC 21 a	44 (N)	14 (N)	35 (N)	35 (N)
SC 22	20 (P)	14 (P)	-	-
SC 28	10 (N)	-	-	-
SC 30	40 (N)	24 (N)	56 $\frac{1}{2}$ (N)	27 (N)
SC 32	35 (P)	31 (P)	20 (P)	20 (P)
SC 33	15 (P)	-	15 (P)	13 (P)
SC 35	5 (N)	9 (N)	-	-
SC 37	57 (N)	71 (N)	-	-
SC 38	15 (N)	15 (N)	15 (N)	postpone
SC 39	35 (P)	20 (N)	15 (N)	12 (P)
SC 40	28 (P)	30 (P)	30 (P)	30 (P)
SC 41	10 (N)	-	10 (N)	10 (N)
I	34 (P)	35 (P)*	24	21
K	3	2	2	2

*) Sharing for part of time.

SC 11: Mesic X rays. (CERN-Karlsruhe-Munich-Stockholm: Backenstoss et al.; NSC 65/2, PH III-67/33, 68/24, 68/39, 68/55, 71/29, 71/39, 72/11).

Backenstoss presented the report PH III-72/32 which was noted by the Committee.

5. NEW PROPOSALS FOR EXPERIMENTS AT THE SC

PH III-72/10 Proposal: Experimental test of muonium production in very-low-pressure gases. (Berne: Hofer et al.).

Hofer presented the proposal. In the discussion, Otten asked whether the electric field seen by 2S muonium when traversing the magnetic field would not lead to Stark mixing and quick decay to the 1S state. Hofer replied that calculations suggested that this was probably not a very important effect. In any case, he said, the study of the 2S state was not the only investigation one might like to carry out if the proposed work shows that the production of muonium in very-low-pressure gas is feasible. Ericson asked whether there would not be background due to the production of pionium; Hofer replied that this would be gated out.

Concerning scheduling, it was pointed out that it was not yet clear whether the experiment could be ready to run before 30 June, but that the proposers would like to have at least part of the requested 30 main-user shifts in June if they succeed in having the apparatus ready in time.

6. RECOMMENDATIONS CONCERNING THE SC PROGRAMME

6.1 Approved experiments

In the discussion of the Coordinator's proposals (Table 1), Spighele asked what were the scientific reasons for cutting Experiment SC 30 so severely. Wilkinson replied that he felt the general principle should be that one should try to finish experiments with clear limited objects before the SC shutdown. Experimental programmes, with a wider scope and with objectives that cannot, perhaps, be attained completely in any case could be cut with less damage. Stroot said that their objective was limited as they did not intend to continue their present programme at the Improved SC. Kofoed-Hansen mentioned that the SC 30 programme had already received more than 260 main-user shifts. Wilkin asked what information would be lost due to allocation of fewer shifts than requested. Stroot replied that the measurements of 180° backward scattering (with detection of the forward ^4He) would suffer most.

Zupančić suggested that scientific priorities involving conflicts between experiments should be decided by the NPRC as the members of the Physics III Committee are likely to be biased, being involved in experiments themselves. Wilkinson, on the other hand, felt that the Physics III Community was quite able to set its own priorities.

After further discussion the Committee decided to accept the Coordinator's proposals with the addition that SC 30 should receive at least 15 main-user shifts in July if the SC is running during that month.

6.2 New proposal

PH III-72/20 Proposal: Experimental test of muonium production in very-low-pressure gases. (Berne: Hofer et al.).

Wilkinson proposed that the Committee recommend acceptance because of the importance of the new technique to be tested. Engfer commented that it would not be possible to give shifts to this experiment before 30 June unless they were taken from SC 39/40; Wilkinson proposed that this be done if the apparatus is ready.

The Committee agreed to recommend as follows:

"The Committee recommends approval of this experiment. If preparations are completed in time, the recommended allocation is 12 main-user shifts in May/June, followed by 18 main-user shifts later if the SC continues to run. Otherwise, a recommendation may be discussed at the June meeting of the Committee. The experiment code will be SC 42.

6.3 Recommended programme of experiments at the SC

The programme recommended by the Committee is set out in Table 2. Firm recommendations are given for allocations up to 30 June 1972; they are, as usual, subject to adjustments by the SC Coordinator. Estimates made by the groups of the main-user time they will request if the SC continues to run from 1 July 1972 onwards are listed, but the Committee has not made a recommendation concerning them.

7. DATE OF NEXT MEETING

It was agreed to hold the next open meeting on Wednesday, 14 June 1972 at 14.30 hours.

Table 2

SC Experiments, Status and Proposed Allocations to 30 June 1972

Code	Group	Description of experiment	NPRC approval	Status as of 15.3.72	Shifts used (1) 1.1.68-24.12.71		Main-user shifts (2) allocated	Main-user shifts (2) recommended	Main-user shifts (2,3) requested	Remarks (4)
					Main user	Paras.				
SC 2a	Berlin-Darmstadt-Fribourg-SIN (Engfer, Kankeleit et al.)	Nuclear excitation and isomer shifts in muonic atoms (67/1,67/43,68/13,68/30,68/59,70/16)	8.11.67	in progress	475	248	7(N)	35(N)	30(N)	
SC 4a	Orsay (Yiou et al.)	Nuclear reaction cross-sections for cosmic-ray problems (68/6,68/54,70/27,71/59).	7. 2.68	in progress	33	-	12	5	5	Continuation planned for Improved SC (PH III-72/15)
SC 9	CERN/DI-HP (Baarli et al.)	Radiobiology (69/12,70/40,70/53).	17. 3.65	in progress	80	9	-	-	6	Continuation planned for Improved SC (PH III-72/26)
SC 11	CERN-Karlsruhe-Munich-Stockholm (Backenstoss et al.)	Mesic X-rays (NSC 65/12,67/33,68/24,68/39,68/55,71/29,71/39,72/11,72/32)	17.11.65 5. 7.67	in progress	432	209	56(N)	-	36(N)	
SC 19b	Lausanne-Munich (Joseph et al.)	$\pi^- p + \gamma + n$ and $\pi^- + p + r^0 + n$ near (3,3) resonance (71/3,71/45)	3. 2.71	in progress	82	52	62(N)	43(N)	40(N)	
SC 21a	CERN-Pisa (Polacco, Zavattini et al.)	2S-2P energy differences in $(\mu \text{He})^+$, (70/47)	3. 2.71	in progress	72	14	14(N)	35(N)	40(N)	
SC 22	CERN-ETH-Geneva-Grenoble (Hess, Werrren et al.)	Nucleon-nucleus cross-sections (68/4,68/26,68/67,70/6,70/42,71/50)	8. 5.68	in progress	100	497	14(P)	-	-	Parasitic running only for time being. Continuation planned for Improved SC (PH III-72/29)
SC 28	CERN (Charpak et al.)	Development of multiwire proportional chambers for ISR experiments (69/31)	4. 2.70	in progress	9	93	-	-	-	Parasitic running only for time being
SC 30	IISN Belgique-Orsay (Spigheil, Stroot et al.)	$\pi^- \text{He}$ scattering around the (5/2,3/2) resonance (69/27,70/25,71/26,71/38)	3. 6.70	in progress	263	16	24(N)	27(N)	40(N)	15 shifts in July promised if SC continues to run
SC 32	Clermont-Ferrand-Lyon-Strasbourg (Combe, Quicroux et al.)	Small-angle pp, pd, $p^0 \text{He}$ scattering at 600 MeV (70/34,71/41)	28.10.70	in progress	150	-	31(P)	20(P)	30(P)	
SC 33	Clermont-Ferrand-Bordeaux-Milan (Alard, Pasinetti et al.)	Emission of protons and light fragments from p-nucleus collisions (70/41,70/51,71/28,71/52)	28.10.70 4. 6.71	in progress	60	11	-	13(P)	-	Includes time to obtain data for radiation biology (70/51,71/28)
SC 35	Heidelberg (Heusser et al.)	Production of radio nuclides by μ^- capture (71/1,71/27)	3. 2.71	finished	9	-	9(N)	-	-	Continuation planned for Improved SC (PH III-72/33)
SC 37	CERN-Birmingham-London-Pisa (Bailey et al.)	π^- -nucleon scattering lengths (71/18,71/37,72/9)	4. 6.71	in progress	43	33	71(N)	-	40(N)	
SC 38	Karlsruhe-Trieste (Boschitz et al.)	$^1\text{O}(\pi^-, \alpha)$ reactions (Tests) (71/22,71/47)	4. 6.71	in progress	-	18	15(N)	-	45(N)	Main experiment planned for Improved SC
SC 39	CERN-Oxford-Göteborg-London-SIN (Domingo, Tanner, Wilkin et al.)	π^+ elastic scattering at 400 MeV/c (71/24,71/48)	4. 6.71	in progress	43	-	20(P)	12(P)	-	12 shifts recommended for May/June may be shifted to July if SC 42 ready in May/June
SC 40		π^\pm nucleus total cross-sections (71/49)	12.10.71	in progress	15	-	30(P)	30(P)	45(P)	
SC 41	ETH-SIN-Darmstadt-Fribourg (Engfer et al.)	Strong-interaction quadrupole effect in pionic ^{179}Lu (72/5)	2. 2.72	-	-	-	-	10(N)	10(N)	
SC 42	Berne (Hofer et al.)	Tests of muonium production in low-pressure gas (72/20)	pending	-	-	-	-	see remarks	30	If ready in May/June, 12 of 30 shifts may be allocated in that period (see SC 39)
I	ISOLDE Collaboration	ISOLDE programme (69/1,70/4,70/48,71/46,72/7)	12. 2.69 3. 2.71	in progress	323	-	35	21	36	Continuation planned for Improved SC (PH III-72/27)
K	Nuclear Chemistry (Bordeaux-CERN-Darmstadt-Oslo)	Nuclear chemistry (70/33,70/36,70/37,70/58)	23. 9.70	in progress	9	-	2	2	2	

(1) Data supplied by MSC Division.

(2) Parallel running possible for experiments marked N (neutron side) with experiments marked P (proton side).

(3) Requests made by the groups in case the SC improvement shutdown is delayed beyond 30 June 1972. A recommendation has not yet been made by the Committee concerning these requests.

(4) Remarks concerning future work at the Improved SC are based on Letters of Intention. The Committee has not yet made any recommendations for approvals of experiments or time allocations at the Improved SC.