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PHYSICS III COMMITTEE

DRAFT MINUTES OF THE MEETING OF THEPHYSICS III COMMITTEE

HELD ON

29 SEPTEMBER 1971 AT 2.30 P.M.

PRESENT

Backenstoss, G.	Karlsruhe	Le Dallic, G.L.D.	CERN
Bailey, J.M.	NINA Daresbury	Michaelis, E.G.	CERN
Barbier, M.	CERN	O'Ceallaigh, C.	I.A.S. Dublin
Bergström, I.	CERN	Pasinetti, A.	Milan
Binon, F.G.E.	IISN Brussels	Querrou, M.	Clermont-Ferrand
Boschitz, E.T.	Karlsruhe	Rohlin, J.	Göteborg
Böhringer, T.	Zurich	Röschert, G.	HMI Berlin
Bressani, T.	Torino	Serre, C.	Grenoble
Bugg, D.V.	Q.M.C. London	Schwaller, P.S.	SIN Zurich
Chiavassa, E.	Torino	Scheck, F.	SIN Zurich
Cernigoi, C.	Trieste	Schmitt, H.	CERN/Munich
Daniel, H.	Munich	Schneuwly, H.	Fribourg
Feiffer, P.	Karlsruhe	Schwarz, E.	Neuchatel
Fischer, W.	SIN Zurich	Soergel, V.	Heidelberg
Gottfried, K.	CERN	Spighele, M.	Orsay
Haenny, C.	IPN Lausanne	Stroot, J.P.	IISN Brussels
Hansen, P.G.	CERN	Tanner, N.W.	Oxford
Herz, A.J. (Secretary)	CERN	Tauscher, L.	Karlsruhe
Hess, R.	Geneva	Ullrich, H.	Karlsruhe
Heusser, G.	Heidelberg	Vaucher, B.	Lausanne
Joseph, C.	Lausanne	Vincent, J.	SREL Virginia USA
Kankeleit, E.	Darmstadt	Walter, H.C.H.	SIN Zurich
Koch, H.	CERN/Karlsruhe	Wilkinson, D.H.	Oxford
Kofoed-Hansen, D. (Chairman)	CERN	Zupančič, C.	Munich

1. INTRODUCTORY REMARKS

The sorrow and sadness felt by the members of the Committee at the tragic news of the death of René Bernas was given expression by Kofoed-Hansen. The meeting maintained a brief silence as a token of respect.

Kofoed-Hansen extended a special welcome to Professor D.H. Wilkinson (Oxford), a new member of the Committee. He also mentioned the conferences relevant to the work of the Committee which had been held recently at Dubna and Strasbourg, and that the extended meeting of the Physics III Committee, intended to cover long-term plans, would probably be held in March 1972.

2. MINUTES OF THE MEETING OF 12 MAY 1971

The Draft Minutes (PH III-71/36) were approved.

3. REPORT ON DECISIONS MADE BY THE NPRC

Kofoed-Hansen reported that the Nuclear Physics Research Committee, at its meeting of 4 June 1971, had approved the recommendations made on 12 May 1971 (PH III-71/36), with two exceptions:

- (i) a time allocation in beam  $k_{12}$  had not yet been made for experiment P9, and
- (ii) a decision had not yet been made concerning the provision of a second slow- $K^-$  beam ( $k_{17}$ ), needed for experiments P7 and P11.

4. REPORTS ON EXPERIMENTS AT THE PS

P7        Studies of X rays from exotic atoms (CERN-Karlsruhe-Heidelberg: Backenstoss et al.)

The Committee took note of the status report PH III-71/53.

Kofoed-Hansen reported that the results of the experiments being carried out to establish whether or not superheavy elements are produced in interactions of high-energy protons with heavy-element targets were still inconclusive.

A list of PS experiments (including the proposed experiment P17) is given in Table 1.

5. PROPOSAL FOR AN EXPERIMENT AT THE PS

PH III-71/40: "Etude de diffusion cohérente  $p\text{-}^4\text{He}$  à 24 GeV par une méthode de recul utilisant des détecteurs à semiconducteur" (Clermont Ferrand-Strasbourg: Combe, Fridman, Querrou et al.).

Querrou presented the proposal. There was a brief discussion on some points of detail. The Committee decided to recommend approval of this experiment for parasitic running in a slowly ejected proton beam. The total running time will be one year, starting about April 1972. The experiment code will be P 17.

6. REPORT ON THE STATUS OF THE SC IMPROVEMENT PROGRAMME

Michaelis presented the report PH III-71/55.

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

The Committee took note of the following status reports and requests for machine time:

- PH III-71/39: Memo from Backenstoss et al. re SC 11.
- PH III-71/43: Memo from Joseph et al. re SC 19b.
- PH III-71/50: Memo from CEGG collaboration re SC 22.
- PH III-71/38: Memo from Spighel, Stroot et al. re SC 30.
- PH III-71/41: Memo from Querrou et al. re SC 32.
- PH III-71/52: Memo from Alard, Pasinetti et al. re SC 33.
- PH III-71/37: Memo from Bailey et al. re SC 37.
- PH III-71/47: Add. to exp. SC 38 (Boschitz, Cernigoi et al.).
- PH III-71/48: Interim report on exp. SC 39 by Tanner, Wilkin et al.
- PH III-71/46: Memo from ISOLDE Collaboration re ISOLDE Programme.

Engfer gave a summary report on the status of the experiments. The following had finished their runs at the SC:

- SC 19a  $\pi^- + p \rightarrow \pi^0 + n$  backward differential cross-section. (Lausanne-Munich-Torino; Bressani, Joseph et al.: PH III-71/7, 70/24).
- SC 31  $0^\circ$  cross-section of the reaction  $^3\text{He}(p, \pi^+)^4\text{He}$  at 600 MeV. (Oxford-Göteborg; Tanner, Domingo et al.: PH III-70/17).

Engfer then presented the requests for machine time submitted by the groups for the next two three-month periods. They are listed in Table 2. It was noted that even with all possibilities for sharing exploited to the full, it would not be possible to satisfy the demand. There was a detailed discussion of a number of suggested ways of increasing effective running time. Zupančič asked whether it would be possible to delay the shutdown for the improvement programme by, say, 15 days, but it was felt that this was not a measure one should plan at this stage. Reduced time allocations for the periods 1.10.1971 to 24.12.1971 and 1.1.1972 to 31.3.1972 were proposed by Engfer; they are given in Table 3. On the suggestion of Kofoed-Hansen, the Committee decided to recommend these allocations as a firm programme for the period 1.10.1971 to 24.12.1971 (subject to the usual adjustments at the discretion of the SC Coordinator), and as a tentative programme for the first three months of 1972. It was decided also that the situation should be reviewed at the January meeting of the Committee.

8. PROPOSAL FOR AN EXPERIMENT AT THE SC

PH III-71/49: "A proposal to measure the  $\pi^+$  and  $\pi^-$  total cross-sections for several nuclei in the energy range 110-300 MeV." (CERN-London-Oxford-Göteborg-SIN: Wilkin, Tanner et al.).

Schwaller presented the proposal. The discussion was concerned mainly with the question how much main-user time would be needed to carry out the experiment. Eventually Kofoed-Hansen proposed that the experiment be recommended to the NPRC for approval, but with a time allocation not exceeding 30 main-user shifts. The Committee agreed. The experiment code will be SC40.

9. DATE OF NEXT MEETING

The Committee agreed to hold the next meeting on 26 January 1972.

10. ANY OTHER BUSINESS

Kofoed-Hansen said he had been asked to inform the Committee that SIN was considering the design of spectrometers, and that people with opinions on the subject should contact SIN. Domingo asked whether it would not be useful

for CERN/MSU and SIN to exchange information on designs and possibilities, and Kofoed-Hansen agreed, suggesting that Domingo might act as contact man.

A.J. Herz.

Table I

## Status of Physics III programme at the PS

Code	Group	Description of experiment; documents	NPRC approval	Status on 29.9.71	Beam	Time allocation (weeks)	Weeks remaining	Remarks
P6	CERN-Heidelberg-Warsaw (Povh et al.)	Hypernuclear $\gamma$ rays (69/10, 70/8, 70/20, 70/32)	4.6.69	FINISHED	$K_{12}$	5 in 1971	-	
P7	CERN-Karlsruhe-Heidelberg (Backenstoss et al.)	X rays from exotic atoms (67/32, 69/15, 70/55, 71/53)	4.6.69	Interrupted	$K_{12}$ ( $K_{17}$ )	6 in 1971	No allocation at present	New slow- $\bar{K}$ ( $\bar{p}$ ) beam recommended (proposed $K_{17}$ )
P8	CERN-Heidelberg-Warsaw (Povh et al.)	Hypernuclear spectroscopy ( $\pi$ spectra, stopping $K$ ) (70/19)	4.6.71	in preparation	$K_{12}$	2 following S109	2	
P9	Torino (Bressani et al.)	Hypernuclear spectroscopy ( $\pi$ spectra, $K$ in flight) (70/5, 70/23, 70/39, 71/19)	4.6.71	in preparation	$t_1$ $K_{12}$	4 after 71/72 shutdown see remarks	4 →	7 PS weeks in $K_{12}$ recommended
P10	Orsay (Klapisch et al.)	Exotic nuclei; mass spectrometer on line (70/10, 70/15)	23.9.70	in preparation	$e_8$ (FE 74)	2 (1 pulse in 5)	2	
P11	Heidelberg (Povh, Soergel et al.)	High-resolution hypernuclear spectroscopy (71/23)	Pending	-	( $K_{17}$ )	-	-	Requires new slow- $\bar{K}$ beam (proposed $K_{17}$ )
P12	CERN-DIAS-Dublin-Warsaw (Herz et al.)	Energetic heavy fragments from heavy nuclei (71/15)	4.6.71	in preparation	$e_6$	Parasitic	-	
P13	Darmstadt (Bächmann et al.)	Production of $Z \approx 30$ in Cu targets (71/16)	4.6.71	→	$e_6$	-	-	Analysis of Cu targets from PS. May request more material later.
P14	Berne (Hahn, v. Gunten et al.)	Search for superheavy elements (71/17)	4.6.71	in progress	$e_8$ $e_9$	-	-	Analysis of heavy-element targets from PS.
P15	Darmstadt-Marburg (Bächmann, Brandt et al.)	Search for superheavy elements (71/D, 71/E, 71/20)	4.6.71	in progress	$e_9$	-	-	Analysis of heavy-element targets from PS
P16	RHEL-Manchester-Risley (Batty et al.)	Search for superheavy elements	see remarks	in progress	$e_9$	-	-	Priority for receiving heavy-element targets to search for long-lived superheavy elements (Directorate decision endorsed by PH III Committee, see PH III-71/36).
P17	Clermont-Ferrand-Strasbourg (Combe Frimman, Querrou et al.)	$p^+$ $^4\text{He}$ coherent scattering (observation of $^4\text{He}$ recoil) (71/40)	Pending	-	$e_9$	Parasitic (see remarks)	-	Expected to run for 1 year from about April 1972.

Table 2

	Period 1.10.71- 24.12.71 Requested	Period 1.1.72- 31.3.72 Requested
SC 2a DARMSTADT	30 (N)	40 (N)
SC 4a ORSAY	10	13
SC 9 CERN/DI-HP	6.5 (N)	8 (N)
SC 11 CERN-KARLSRUHE-HEIDELBERG	30	30 (N)
SC 16 LOUVAIN	0	0
SC 19a LAUSANNE-MUNCHEN-TORINO	finished	--
SC 19b LAUSANNE-MUNCHEN	75 (N)	150 (N)
SC 21a CERN-PISA	60 (N)	80 (N)
SC 22 CERN-ETH-GENEVE-GRENOBLE	20 (P)	20 (P)
SC 28 CERN-ISR	10 (N)	10 (N)
SC 30 BRUXELLES-ORSAY	75 (N)	50 (N)
SC 31 OXFORD-GÖTEBORG	finished	--
SC 32 CLERMONT-FERRAND-LYON-STRASBOURG	35 (P)	50 (P)
SC 33 CLERMONT-FERRAND-BORDEAUX	15 (P)	0
SC 35 HEIDELBERG	0	5
SC 36 SIN/CERN-CAMBRIDGE	0	0
SC 37 CERN-BIRMINGHAM-LONDON-PISA	40 (N)	50
SC 38 KARLSRUHE-TRIESTE	40 (N)	27
SC 39 CERN-OXFORD-GÖTEBORG	30 (P)	20 (P)
SC 40 CERN-LONDON-OXFORD-GÖTEBORG-SIN	19 (P)	39 (P)
I ISOLDE	30	36
K CERN-NUCLEAR CHEMISTRY	3	5

Table 3

## SC Experiments, Status and Proposed Allocations to 31 March 1972

Code	Group	Description of experiment	NPRC approval	Status as of 30.9.71	Shifts used (1) 1.1.68-30.9.71		Main-user shifts recommended for period 1.10.71 to 24.12.71	Main-user shifts recommended TENTATIVELY for period 1.1.72 to 31.3.72	Expected date of completion	Remarks
					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	445	230	20(N)	20(N)	Shutdown 1972	New proposal for improved SC
SC 4a	Orsay (Yiou et al.)	Nuclear reaction cross-sections for cosmic-ray problems (68/6,68/54, 70/27).	7.2.68	in progress	27	-	5	5(P)	+	Continuing project
SC 9	CERN/DI-HF (Baarli et al.)	Radiobiology (69/12) 70/40,70/53,71/25).	17.3.65	in progress	74	9	6	-	+	Continuing project
SC 11	CERN-Karlsruhe-Heidelberg (Backenstoss et al.)	Mesic X rays (NSC 65/12,67/33,68/24 68/39,68/55,71/29,71/39)	17.11.65 5.7.67	in progress	416	182	26(N)	20(N)	Shutdown 1972	
SC 16	Louvain (Deutsch, Macq et al.)	Partial capture rates for $\mu$ and $\pi$ in light nuclei (67/40,67/41, 68/43,68/44,68/61,70/9 71/9).	8.11.67	interrupted see remarks	149	86		+	+	May submit request at next meeting.
SC 19b	Lausanne-Munich (Joseph et al.)	$\pi^- p \rightarrow \gamma + n$ and $\pi^- + p \rightarrow \pi^0 + n$ near (3,3) resonance (71/3, 71/43).	3.2.71	in progress	19	-	51(N)	80(N)	Shutdown 1972	
SC 21a	CERN-Pisa (Polacco, Zavattini et al.)	2S-2P energy differences in (u He) <sup>+</sup> , (70/47)	3.2.71	in progress	30	12	45(N)	60(N)	Shutdown 1972	
SC 22	CERN-ETH-Geneva Grenoble (Pepin et al.)	Nucleon-nucleus cross-sections (68/4,68/26,68/67, 70/6,70/42,71/50).	8.5.68	in progress	100	468	-	20(P)	Shutdown 1972	
SC 26	Clermont-Ferrand-Strasbourg (Avan, Querrou et al.)	$p + {}^3\text{H}$ , $p + {}^3\text{He}$ scattering (68/32,68/47, 68/66,69/21,69/21 Add. I).	3.12.69	in progress	82	25	+	+	Shutdown 1972	Time for completion included in request for SC 32
SC 28	CERN (Charpak et al.)	Development of multiwire proportional chambers for ISR experiments (69/31)	4.2.70	in progress	9	93	-	10(N)	Shutdown 1972	
SC 30	IISN Belgique-Orsay (Spighel, Stroot et al.)	$\pi^- - {}^4\text{He}$ scattering around the (3/2,3/2) resonance (69/27,70/25, 71/26,71/38).	3.6.70	in progress	221	3	35(N)	25(N)	Shutdown 1972	
SC 32	Clermont-Ferrand Lyon, Strasbourg (Combe, Querrou et al.)	Small-angle pp,pd $p^3\text{He}$ scattering at 600 MeV (70/34,71/41)	28.10.70	in progress	104	-	25(P)	30(P)	Shutdown 1972	Includes machine time for $p + {}^3\text{H}$ part of SC 26
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	55	11	10(P)	-	October 1971	Includes time to obtain data for radiation biology (70/51, 71/28)
SC 34	Marburg (Brandt et al.)	Alpha emitters produced by 600 MeV protons (70/49)	3.2.71	in progress	-	19	-	-		Fully parasitic (ISOLDE)
SC 35	Heidelberg (Heusser et al.)	Production of radio nuclides by $\mu$ capture (71/1,71/27)	3.2.71	in progress	9	-	-	5(N)	Shutdown 1972	
SC 36	SIN/CERN (Engfer et al.)	Tests for experiment on $\mu + e + \gamma$ (70/52)	3.2.71	in progress	1	3	-	-	+	Main experiment planned for Improved SC
SC 37	CERN-Birmingham London-Pisa (Bailey et al.)	$\pi$ -nucleon scattering lengths (71/18,71/37)	4.6.71	in progress	9	18	30	40	Shutdown 1972	
SC 38	Karlsruhe-Trieste (Boschitz et al.)	${}^{16}\text{O}(\pi, nx)$ reactions (Tests) (71/22,71/41)	4.6.71	in progress	-	18	13(N)	15(N)	Shutdown 1972	Main experiment planned for Improved SC
SC 39	CERN-Oxford-Göteborg (Domingo, Tarnier Wilkin et al.)	$\pi^+$ D elastic scattering at 400 MeV/c (71/24,71/48)	4.6.71	in progress	17	-	26(P)	20(P)	Shutdown 1972	
SC 40	CERN-London-Oxford-Göteborg-SIN	$\pi^+$ nucleus total cross-sections (71/49)	pending		-	-	10(P)	20(P)	Shutdown 1972	
I	ISOLDE Collaboration	ISOLDE programme (69/1,70/4,70/48,71/46)	12.2.69 3.2.71	in progress	301	-	25(P)	36(P)	+	Continuing project
K	Nuclear Chemistry (Bordeaux, CERN, Darmstadt, Oslo)	Nuclear chemistry (70/33,70/36,70/37, 70/38)	23.9.70	in progress	6	-	-	5	Shutdown 1972	