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PH III-74/43  
28 June 1974

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## PHYSICS III COMMITTEE

DRAFT MINUTES OF THE MEETING OF THE  
PHYSICS III COMMITTEE

held on

25 June 1974 at 14h.30

PRESENT

B.W. Allardyce	CERN	C.W. Lewis	Karlsruhe
G. Andersson	Göteborg	G. Le Dallic	CERN
J. Baarli	CERN	X. Lombard	CERN (Orsay)
G. Backenstoss	Basel	E.G. Michaelis	CERN
R. Barjon	Grenoble	K.O. Nielsen	Aarhus
F. Bergström	Stockholm	O.B. Nielsen	Copenhagen
T. Bressani	Turin	S.G. Nilsson	Stockholm
L.C. Carraz	CERN	C. O'Ceallaigh	Dublin
C. Cernigoi	Trieste	A. Pascolini	INFN, Frascati
E. Chiavassa	Turin	G. Pauli	Trieste
S. Costa	Turin	P. Pavlopoulos	Karlsruhe
G. Dellacasa	Turin	G. Raisbeck	Orsay
J. Deutsch	Louvain	H. Ravn	CERN
C. Ekström	CERN	G. Rinaudo	Turin
D. Engelhardt	Karlsruhe	C.E. Rufer	CERN
R. Engfer	ETH-Zürich	H. Schmitt	München/CERN
T.E.O. Ericson	CERN	C. Serre	CERN
P. Falk-Vairant	CERN	F. Takeuchi	Karlsruhe
D. Favart	Louvain	N. Tanner	Oxford
W. Fetscher	Karlsruhe	L. Tauscher	Karlsruhe
M. Gusakow	Lyon	H. Ullrich	Karlsruhe
E.L. Haase	Karlsruhe	H. Verheul	Amsterdam
A.M. Habbestad Wätzig	Marburg	C. Wannberg	Uppsala
R. Hagelberg	Karlsruhe	P. Weilhammer	CERN
A.J. Herz	CERN (Secretary)	D.W. Warren	Geneva
R. Hess	Geneva	L. Westgaard	CERN
S. Ingelman	Uppsala	C. Wilkin	CERN
B. Jonson	CERN	D.H. Wilkinson	Oxford (Chairman)
C. Joseph	Lausanne	A.H. Wapstra	Amsterdam
A. Knipper	CRN-Strasbourg	F. Yiou	Orsay

1. MINUTES OF THE MEETING OF 25/26 MARCH 1974

The Draft Minutes (PH III-74/31) were approved without comment.

Secretary's note: Before the meeting it had been pointed out that the Letter of Intention PH III-74/29, submitted by C. Wilkin et al. on 26 March 1974, was not listed on p.5 of PH III-74/31 as it should have been.

2. REPORT ON DECISIONS MADE BY THE NPRC

Wilkinson reported that the Nuclear Physics Research Committee had accepted the recommendations as set out in the Draft Minutes (PH III-74/31).

3. REPORT ON IRRADIATIONS AT THE PS. REQUESTS FOR MACHINE TIME. RECOMMENDATIONS

Ravn reported on irradiations for the following two experiments, carried out since the previous meeting.

P22 Cross-sections and recoil properties of rare gases produced in targets ( $Z = 13$  to 92) irradiated by 24-GeV protons (Gradignan; Regnier et al.: PH III-74/12 rev.).

Three parasitic internal irradiations had taken place. It was now expected that the remaining approved work could be completed with four parasitic irradiations in an external beam.

P23 Angular and energy distributions of heavy fragments from bombardment of uranium and gold (Marburg, Oslo; Habbestad, Hagebø et al.: PH III-74/14, 74/21(I)).

Up to the time of the meeting, the experiment had received one  $\frac{1}{2}$ -hour internal irradiation. Further work had been held up by technical troubles with the internal-irradiation system and by a PS breakdown.

Ravn then suggested that it would simplify matters if the Nuclear Chemistry Coordinator were empowered to authorize and arrange a few minor irradiations, outside the approved programme, by consultation with the PS Coordinator and the MPS Division. Wilkinson said he thought it would be a good idea to ask the NPRC to agree to this, with the requirement that any such irradiations be reported to the Physics III Committee at the next meeting. Weilhammer, the PS Coordinator, gave his opinion that up to three such internal irradiations could be accepted up to the end of 1974, and that one should consider an upper limit for 1975 when the PS programme for that year is known. He added that all ways of minimizing the effect on the PS programme must be considered carefully. Wilkinson said one should not be too rigid concerning the number of irradiations the Nuclear Chemistry Coordinator would have at his disposal; close collaboration between the Coordinators was, of course, needed.

The Committee agreed to recommend that the Nuclear Chemistry Coordinator be empowered to authorize a few minor or urgent internal irradiations. It is to be understood that such irradiations will be reported to the Physics III Committee at the meeting following them.

A summary of the Physics III programme of the PS is given in Table 1.

#### 4. NEW PROPOSAL FOR IRRADIATIONS AT THE PS

PH III-74/25 Proposal for the continuation of experiment P18: Study of fragmentation cross-sections of astrophysical interest (Orsay; Raisbeck, Yiou: PH III-72/15, 74/28).

Yiou presented the proposal.

The Committee agreed to recommend approval of the continuation of the project. If prime PS time is not required, irradiations should be arranged directly with the Coordinators; should prime PS time be needed, a request is to be made in advance to the Physics III Committee. A progress report should be submitted to the Physics III Committee approximately every six months.

5. REPORT ON THE STATUS OF THE SC IMPROVEMENT PROGRAMME - NEWS FROM SIN AND LAMPF

Michaelis presented the status report PH III-74/40. In response to questions from the floor he added (i) that it would be possible to use internal targets but that he would like to get the extraction working first; (ii) that the beam lines, but perhaps not the cryotarget, were expected to be ready when the machine is started; and (iii) that the provision of the cryotarget was being treated as a matter of urgency and that it might well be operational in time.

Gerber summarized the situation at SIN, mentioning, in particular, that they expected to have twelve physics groups working at the machine from October 1974 onwards.

Michaelis said that LAMPF had concentrated on  $H^-$  acceleration, running (in May) at a few  $\mu A$ . They had achieved a few hours' running at 100  $\mu A$ , but this was not usable for experiments because of lack of shielding.

6. PROPOSALS AND LETTERS OF INTENTION FOR EXPERIMENTS AT THE SC. RECOMMENDATIONS (see Table 2 for summary of programme)

PH III-74/36 Precision measurement of the partial muon-capture rate

${}^6Li \rightarrow {}^6He$  : Beam request for tests. (Louvain; Deutsch et al.:  
g.s.)

PH III-74/9).

Deutsch presented the proposal. Wilkinson proposed that the tests be approved in principle for a total of 25 shifts, but that they should be scheduled only when the uncertainty concerning the population of the mesic hyperfine levels was resolved.

After some further discussion the Committee agreed to recommend approval in the form suggested by Wilkinson. The Experiment Code will be SC59.

PH III-74/37 Search for a new mode of  $\pi^-$  capture in nuclei:  $\pi^- + A \rightarrow B + 2\gamma$

(Louvain; Deutsch, Favart et al.: PH III-74/10).

Favart presented the proposal for this exploratory experiment. There was an extensive discussion of possible sources of background. Wilkinson suggested that approval be recommended for testing, but that further thought be given to the line the experiment should take. The Committee decided to recommend approval in principle and requested a report on further developments to be submitted at the next meeting. The Experiment Code will be SC60.

PH III-74/38 Letter of Intention: Study of the production of neutral pions by neutrons and investigation of the possibility of observing secondary interactions (CERN-Oxford; Allardyce et al.).

The Committee took note of this document.

PH III-74/39 Proposal: Test measurement for an experiment on weak neutral currents in muonic atoms (CERN-Karlsruhe-Basel; Backenstoss et al.).

The Committee agreed to recommend approval of this test; scheduling to be decided later. The Experiment Code will be SC61.

7. PROGRESS REPORT ON STUDIES AND PLANS FOR THE ACCELERATION OF HEAVY IONS IN THE SC

Michaelis presented the report PH III-74/42.

8. REPORT ON PLANS FOR THE OMICRON PROJECT

At the start Wilkinson reminded the meeting that the original idea for this project had come from the Torino group who had pointed out (PH III-73/13) that the kind of spectrometer with which they had already gathered experience could be useful in a variety of applications. A working party had then been set up and a preliminary report, based on several months of work, had now been prepared. Wilkinson outlined some general considerations which should guide the Committee in its judgement: if the device is to be built it must be truly wanted by the Physics III community, there must be an adequate team which commits itself to work on the construction,

and there must be a strong academic demand, perhaps also from groups who are unable to participate in the building but intend to use Omicron once it is there.

Tanner then presented the report PH III-74/41. In response to questions he added that neither the cost of personnel nor that of a cryogenic target were included in the estimates.

Wilkinson asked for comments - both (non-committal) expressions of interest, and on such matters as the fact that Omicron would be relatively large and might obstruct space wanted for other experiments. Deutsch said that he, personally, considered Omicron to be an exciting project, and he asked what it was that might be obstructed by it. Michaelis replied that it would be in the way of neutron experiments with a long flight path. Backenstoss asked whether Omicron could share beam with other experiments and Michaelis said it could once there are enough protons.

Wilkin pointed out that experiments such as  $\pi^+p \rightarrow \pi^+\pi^+p$  or  $\pi^+\pi^+n$  at threshold would be extremely difficult to do except with an instrument as ideal as Omicron. Thus, if people thought that the investigation of processes of this kind was important, one would have to have Omicron. Furthermore, he said, the very good duty cycle would make the SC2 the best machine for such experiments. Gerber commented that the SC2 would not have a duty-cycle advantage over SIN if one carried out the experiments without chambers or counters in the incoming beam. Hess asked for a comparison of Omicron with facilities planned or existing elsewhere. Wilkinson replied that a comparison had been presented to the Committee at the meeting of 26 March 1974 and that the conclusion had been that none of the other spectrometers offered the same possibilities so that Omicron would be complementary to them.

Wilkinson then asked for a show-of-hands vote to decide whether or not the Omicron Working Party should continue its activities. The result was:

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for continuation	30
against continuation	0
indifferent	8

the remainder of those present abstaining.

Wilkinson concluded that planning should go ahead, and he emphasized again that increased interest in the project, and a commitment to participate in the construction from an adequate team, would be needed to obtain full approval. Falk-Vairant added that the NP Division would cooperate if Omicron were wanted by the physicists and built by them.

9. DATE OF NEXT MEETING

It was decided provisionally to hold the next meeting on Wednesday, 2 October 1974.

A.J. Herz

Table 1

## Programme of Physics III irradiations at the PS

Status as of 25 June 1974

Code	Beam	Experiment	Team	Documents	NPRC approval	Irradiation time	Remarks
P18	Internal (stand-by), some external	Fragmentation cross-sections of cosmic-ray interest	Orsay: <u>Yibu</u> , <u>Raisbeck</u>	72/15, 74/28 74/35	pending	To be arranged with Nuclear Chemistry Coordinator	Special request to be submitted whenever prime PS time is required - progress reports to be submitted about every six months
P22	Some internal; mainly external	Production cross-sections and recoil properties of rare gas nuclei produced in various target elements	IN <sub>2</sub> P <sub>3</sub> Bordeaux- Gragnan: <u>Regnier</u> , Simonoff-Lagarde, Simonoff	73/12 rev.	17.4.74	To be arranged - see remarks	Must not use prime PS time
P23	Internal	Angular and energy distributions of heavy fragments from bombardment of uranium and gold	Marburg-Oslo: <u>Habestad</u> , <u>Alstad</u> , <u>Glomset</u> , <u>Hagebø</u> , <u>Haldersen</u> , <u>Johansen</u> , <u>Methasiri</u> , <u>Peppas</u> , <u>Esterlund</u> , <u>Patzelt</u>	74/14, 74/21(I)	17.4.74	9 x 1 hour - see remarks	Group has been asked to try to find a way of reducing the load on the PS



Code	Experiment	Team	Documents	Appr. Approval	Conditions concerning running time	Remarks
SC50	Measurement of nuclear cross-sections of astrophysical interest	Urey: Jany, Raisbeck, Fonten, Perron	73/10	17.4.74	About two shifts per month (less initially)	Progress report and continuation request to be submitted at least once a year.
SC51	Study of neutron-deficient nuclei between Pb and Hg, using helium jet transport technique	Martburg-Gieson: Brandt, Jungclas, Moizmann, Patzelt, Westmeier, Walthelm, Wolnik, Kornobl, Wagner, Walcher	74/15	17.4.74	Must be initially parasitic	Parasitic to ISOLDE
SC52	Measurement of average energies, forward momenta and anisotropies of specific fission products from disintegration of Pu by 600-MeV protons	Martburg-Oslo: HobbasLag, Alstad, Glumest, Haegge, Haldorson, Johansen, Pappas, Methasiri	74/21 (III)	17.4.74	4 x 2 hours internal plus two long parasitic runs in external beam	To run in 1975. Cannot run downstream of ISOLDE target
SC53	Study of products of binary fission in disintegrations of U, Pb, Pr, Ag, Sr and Cs by 500-MeV protons	Lund-Galo: Andersson, Areskjog, Gustafsson, Lytton, Schroder, Hagebo	74/12	17.4.74	No undertaking as to rate at which programme will be implemented	To start in 1975
SC54	Calibration of neutron detectors used in PS experiment S172	Birmingham-RHEL-London (Westfield): Strong, McMahon et al.	73/5 74/1	17.4.74	Must not absorb more than one month of physics time with beam sharing. See remarks	Additional time may be made available in a manner as not to impede machine development or other experimental programmes
SC55	Study of particle emission in absorption of stopped $\pi^-$ in $^{16}\text{O}$	Karlsruhe-Trieste: Kesselack, Engelhardt, Faase, Lewis, Tokutomi, Ulrich, Zernigui, Pauli, Moschini	73/22 74/6	17.4.74	See remarks	Testing facilities requested as early as possible; very poor beam quality acceptable for tests
SC56	Tests for experiment at STN	University of London et al.	74/4	17.4.74		Suitable beam likely to be available early, during first 6 months of operation
SC57	Radio-biological effectiveness, and its dose-rate dependence, of 59.5-MeV neutrons	CEA Health Physics: Sauti, Bianchi, Nordell, Sullivan	74/11	17.4.74	About 18 shifts at dose rates similar to those obtained in SC1. See remarks	Cannot run before SC2 operation has become stable and reliable. Experiments require advance notice for preparation of material
SC58	$\text{U}(p,X)^{234}\text{Pa}$ reactions with protons between 170 and 300 MeV	Martburg-Oslo: HobbasLag, Alstad, Glumest, Haegge, Haldorson, Johansen, Methasiri, Pappas	74/21 (II)	17.4.74	6 x 1 hour internal plus two parasitic runs in external beam	Cannot run downstream of ISOLDE target
SC59	Tests for partial $\mu$ capture rate $^6\text{Li}+^4\text{He}$ , g.s.	Louvain: Deutsch et al.	74/6 74/30	pending	Up to 25 shifts	To be scheduled when uncertainty concerning population of hyperfine levels resolved
SC60	Search for $\pi^+ + \text{K}^0 + \gamma$	Louvain: Deutsch, Favari et al.	74/10 74/37	pending	See remarks	Approved in principle. Time allocation to be discussed after report on studies of possible backgrounds
SC61	Tests for experiment of weak neutral currents in $\mu$ atoms	CCRN-Karlsruhe-Basel: Beckmann, Fetscher, Haegge, Koch, Pavloukous, Van, Williams, Lauscher	74/39	pending	See remarks	Scheduling to be decided later
SC62	ISOLDE programme	ISOLDE Collaboration (Chairman: H.J. Matsumu)	73/15 74/15	17.4.74	12 shifts per month (less initially)	