

CERN/INTC 2000-030
INTC 4
25 May 2000

ISOLDE AND NEUTRON TIME-OF-FLIGHT EXPERIMENTS COMMITTEE (INTC)

Minutes of the Fourth meeting on
Monday 15 May, 2000

OPEN SESSION

The Chairman opened the meeting with a few brief words of welcome. He also stressed that since one nTOF and one ISOLDE proposal are already awaiting the committee's attention, and that four more are already expected for the September 25th meeting, the deadline for submission of proposals to this meeting will be advanced From Monday 4 to Friday 1 September.

M. Lindroos, PS technical coordinator for ISOLDE operations summarised the present technical status of the ISOLDE facility. He also recalled the organization and tasks of the various PS groups and noted that J. Lettry (whose responsibility is ISOLDE targets and front ends) should be contacted for eventual questions concerning new radioactive beams and for collaboration on target issues. T. Giles is the contact person for the HRS, now expected to be working in low resolution (16000) mode from 11 September.

Thomas Nilsson the ISOLDE physics coordinator, presented a brief summary of the status of the ISOLDE programme. About 5 weeks of running have been achieved since the year 2000 startup. Some fine-tuning of the of the draft schedule has been necessary, but it is expected that most of the 380 shifts foreseen in the most recent version of the schedule for 2000 will be delivered.

E. Radermacher then presented a Status Report for the nTOF facility. Much of the equipment already has been installed or will be forthcoming in the next month. The schedule therefore assumes that commissioning will begin between the middle and the end of June, with the beam expected to be fully available for experimenters in August.

Presentations were then made of the following proposals and progress reports:

- P90 Add. 1** (INTC 2000-011): Use of radioactive ion beams for bio-medical research.
- P34 Add. 3** (INTC 2000-023): Neutron-rich silver isotopes produced by a chemically selective laser ion-source (Status Report on experiment IS333 part III and Request for Beam Time).
- P69 Add. 1** (INTC 2000-027): Enzymatic Mercury Detoxification: The Regular Protein MerR - DNA Interaction and the Mercuric Ion Reductase MerA.
- P91 Add. 2** (INTC 2000-002): Further Measurements of the ${}^7\text{Be}(p, \gamma){}^8\text{B}$ cross section with an implanted radioactive ${}^7\text{Be}$ target and its implications for the solar-neutrino "puzzle".
- P118** (INTC 2000-006): Charge radius measurement of the halo nucleus ${}^{11}\text{Li}$.
- P120** (INTC 2000-010): Probing the structure of very neutron-rich nuclei in the sd-pf shell by combined delayed neutron and gamma spectroscopy.

- P124** (INTC 2000-017): The importance of $^{22}\text{Ne}(\alpha,n)^{25}\text{Mg}$ as *s*-process neutron source and the *s*-process thermometer ^{151}Sm .
- P127** (INTC 2000-022): Studies of electric dipole moments in the octupole collective regions of heavy Radiums and Bariums.
- P128** (INTC 2000-024): Beta-decay study of neutron-rich Tl, Pb, and Bi by means of the pulsed-release technique and resonant laser ionisation.
- P129** (INTC 2000-028): Precision mass measurements of argon isotopes.

CLOSED SESSION

Present: B.W. Allardyce, J. Aystö, C. Détraz, J-P. Delahaye (part time), J-P. Duraud, J. Eades (Secretary), H. Flocard (Chairman), P. Van Isacker, K-L. Kratz, , M. Lindroos, T. Nilsson, H. Ravn, C. Rossi-Alvarez, J-P. Riunaud, B. Rubio, W. Scobel, R. Voss (for G. Goggi), P. Walker.

Apologies: W. David, K.P. Lieb, K. Langanke, E. Migneco.

The minutes of the third meeting were first approved without change, and the committee proceeded to discuss matters arising from it. The first of these was the nTOF Technical Design Report(TDR). The external referee has summarised the points he made at the last meeting in the form of a written list of questions, to which the nTOF group has very recently replied. When various modifications to the TDR have been made and additional supporting documents have been presented on these questions (including safety-related issue) it is hoped that the TDR can be accepted by the committee at the September meeting. The final evaluation of the document will be made by the external referee in conjunction with one internal referee from the INTC. In addition, the internal referee will be in charge of conducting an evaluation of issues not addressed in the TDR, including the collimation of the neutron beam, the experimental hall, and the neutron detection equipment.

The committee noted that following a written request from Thomas RUF, SPS/PS coordinator, the situation concerning the way nTOF shifts will be scheduled has now been clarified. Beam time requests for nTOF will be discussed between the ISOLDE coordinator and the SPS/PS coordinator prior to the relevant INTC meeting. The ISOLDE coordinator will inform the INTC about any proton beam allocation issues arising from these discussions, and will discuss the INTC's own recommendations once more with the SPS/PS coordinator before the following Research Board. Final details of allocations will be settled by the two coordinators after Research Board approval has been given.

During discussions of the ISOLDE backlog in the previous two meetings, a decision had been postponed concerning REX-ISOLDE, commissioning of which contributes 150 shifts to the 700-shift total. The spokesman has in the meantime informed the committee of REX-ISOLDE's progress, and has suggested that a reduced number of shifts corresponding to three weeks (63 shifts) now seems to be adequate. The committee accepted this new estimate, congratulated the team on its achievements so far, and asked the spokesman to present a progress report in one of the remaining two meetings in 2000.

Concerning the ISOLDE reports of T. Nilsson and M-Lindroos, the committee welcomed the good news concerning the HRS (high resolution separator) which is now at the 16000 resolution specified in the Audit, and congratulated PS division on its success in quickly matching the high level of competence that was always a feature of the former ISOLDE technical group.

Concerning the nTOF status report, the committee noted that the commissioned beam is expected in August, but saw no conflict with the September date by which adequate replies to questions concerning the TDR have been requested.

The proposals and progress reports presented in the open session, were then discussed as follows:

P90 Add. 1: Use of radioactive ion beams for bio-medical research.

The collaboration was thought by the external experts to have made a good case for the proposed continuation, which is clearly of high scientific quality. The 12-shift request will therefore be recommended to the Research Board.

P34 Add. 3: Neutron-rich silver isotopes produced by a chemically selective laser ion-source (Status Report on experiment IS333 part III and Request for Beam Time).

After a short discussion it was agreed that the proposal is timely, technically solid, and that the necessary competence exists within the collaboration. The 30-shift request will therefore be supported by the chairman at the Research Board.

P69 Add. 1: Enzymatic Mercury Detoxification: The Regular Protein MerR - DNA Interaction and the Mercuric Ion Reductase MerA.

Expert opinion has been sought outside the committee for evaluating the merits of this proposal. It was agreed to recommend to the Research Board that the 10-shifts for the test experiment should be allocated. On the other hand, the collaboration lacks the expertise that would guarantee to the INTC that the stated goal of understanding the Hg detoxification mechanism can be achieved or at least approached from results of the real experiment. After a progress report on these tests, the latter may also be supported provided the collaboration can find the appropriate support and additional members in the biochemical field.

P91 Add. 2: Further Measurements of the ${}^7\text{Be}(p, \gamma){}^8\text{B}$ cross section with an implanted radioactive ${}^7\text{Be}$ target and its implications for the solar-neutrino "puzzle".

The committee supported the requested allocation of 6 shifts and recommends that they should be used specifically to explore the low-energy region. The committee recalled its previous suggestion concerning the backscattering problem (February 1998) that the collaboration look into the possibility of using commercially available foils.

P118: Charge radius measurement of the halo nucleus ${}^{11}\text{Li}$.

The relevance of the proposed measurements on ${}^8\text{Li}$, ${}^9\text{Li}$ and ${}^{11}\text{Li}$ is clear. On the other hand, because the technology is being stretched to the limit it was decided to recommend allocation of the 8 test shifts for ${}^8\text{Li}$ and ${}^9\text{Li}$. A progress report showing success with these isotopes should be presented before the actual ${}^{11}\text{Li}$ experiment can be scheduled.

P120: Probing the structure of very neutron-rich nuclei in the sd-pf shell by combined delayed neutron and gamma spectroscopy.

Although it will be interesting to bring to ISOLDE an experiment with the Caen TONNERRE neutron detector, it was agreed that a better-focussed proposal in either the N=20 or the Z=20 regions would be better suited to the facilities offered by ISOLDE. No shift allocation will therefore be made at the moment.

P124: The importance of ${}^{22}\text{Ne}(\alpha, n){}^{25}\text{Mg}$ as s-process neutron source and the s-process thermo-meter ${}^{151}\text{Sm}$.

The scientific case for this proposal seems to be well justified, although it was thought that several technical questions remain concerning the background and other matters. Many of these questions will clearly depend on the results of P123 (Determination of the neutron fluence, the beam characteristics and the backgrounds at the CERN-PS TOF Facility) approved at the last meeting. This is in particular true concerning the number of protons that will be required to do the experiment, the beam request being presented in

weeks of running time. It was therefore decided to consider the experiment as pending, until a Memorandum is received showing whether the results of the overall performance of the nTOF facility as revealed by P123 give suitable answers to these questions. In addition, the INTC would like to have some clarification concerning which of the many authors listed on the title page constitute the working basis of proposal P124.

P127: Studies of electric dipole moments in the octupole collective regions of heavy Radiums and Bariums.

Measuring properties related to the spontaneous octupole deformation is of great interest. The INTC believes that there is a clear priority for the ^{229}Th and ^{226}Ra cases. The committee therefore recommends that initially 24 shifts be allocated for these two cases.

P128: Beta-decay study of neutron-rich Tl, Pb, and Bi by means of the pulsed-release technique and resonant laser ionisation.

The proposed study of neutron-rich nuclei near $Z=82$ should be relevant for understanding nuclear structure at extreme isospin values and it was decided to allocate 26 shifts for an initial exploration. If necessary, an addendum may be presented on the completion of these.

P129: Precision mass measurements of argon isotopes.

The well-written proposal on high precision mass measurements in argon isotopes involves a well-trying technique, and all the necessary expertise is clearly present in the collaboration. The committee was therefore in favour of approving the 17 shifts requested.

OTHER BUSINESS

Two new Letters of Intent have been received:

I32: Doping Properties of Ferromagnetic Semiconductors investigated by the Hyperfine Interaction of Implanted Radioisotopes.

I33: Production of polarized radioactive beams with laser ion sources (Feasibility test).

The production of polarised radioactive beams (I33) was thought to be sufficiently interesting for a feasibility test to be approved, subject to the coordinator being able to find time among his reserved shifts. The committee also took note of the interesting goals of I32 and encourages further studies.

The next ISC meeting is on **25 September 2000**.

J. Eades
INTC Secretary, Tel. 76 74273
John.Eades@cern.ch

INTC Secretariat: Monique Budel (Bldg. 14/4-022); Tel. 76 74270
Monique.Budel@cern.ch