

**ISOLDE AND NEUTRON TIME-OF-FLIGHT  
EXPERIMENTS COMMITTEE**

Minutes of the ninth meeting  
on September 24<sup>th</sup> 2001

**OPEN SESSION**

The Chairman opened the meeting and gave a reminder of the forthcoming INTC meeting and the deadline for proposal submission.

Mats Lindroos, the ISOLDE Technical Coordinator, described the recent technical events related to ISOLDE operation. The earlier repaired GPS front-end which had reached its lifetime limit had again developed a vacuum leak withstanding further repair attempts, rendering the separator unusable since early June in the absence of a spare unit. However, the PS Management Board had already taken the decision to rapidly construct such a unit, which was now nearing completion and originally planned to be operational October 1<sup>st</sup>. An unexpected vacuum problem had however set the completion back by two further weeks. He then reported on the status of the ISOLDE consolidation project, highlighting the major changes in the ISOLDE control system foreseen for the upcoming shutdown. New staff in the ISOLDE team were listed, and the first exchanges of technical personnel with TRIUMF within the technical collaboration established.

The ISOLDE Scientific Coordinator, Thomas Nilsson, reported on the operation in 2001 and the impact of the GPS front-end break-down. A majority of the runs scheduled on the GPS had been rescheduled on the HRS instead, but mainly collections for Condensed Matter Physics had been severely hampered by the lack of relevant infrastructure on the HRS. However, the low-resolution mode of the HRS was now considered as standard operation and both the technical team and the users had gained considerable experience. The recent, first results of charge-breeding in the REX-EBIS of a cooled beam from the REXTRAP was reported on. For the remaining part of 2001, a very dense schedule was presented with the aim to recover as much as possible of the beam time lost due to the GPS problems. Furthermore, a separator course on the HRS was announced for week 49.

Uwe Georg, PS/OP, then presented the plans for improved access control of the ISOLDE experimental hall. These aim to bring the safety level to comply with a "Class C" radioactive laboratory and includes new infrastructure to limit the access to authorized persons and to prohibit uncontrolled movements of contaminated material.

The following proposals were then presented:

1. Charge Breeding of Radioactive Ions in an Electron Cyclotron Resonance Ion Source (ECRIS) at ISOLDE; CERN/INTC 2001-023/P-143; D. Habs.
2. Studies of the Beta-Decay of Sr nuclei on and near the N=Z line with a Total Absorption Gamma Ray Spectrometer; CERN/INTC 2001-024/P-144; P. Dessagne and B. Rubio.

3. Measurements of Fission Cross Sections for the Isotopes relevant to the Thorium Fuel Cycle; CERN/INTC 2001-025/P-145; C. Stephan.
4. n\_TOF Status report

The n\_TOF02 status report (Status report on n\_TOF; CERN/INTC-2001-021) was presented by P. Pavlopoulos. The first part concerned front-end electronics, DAQ and detectors which all had operated according to expectation. The second part concerned the neutron background encountered in the n\_TOF experimental area earlier during the year, being two orders of magnitude higher than expected. Additional simulations completed after the submission of the status report had indicated that a majority of neutrons are likely to originate from muons, themselves resulting from decay of pions produced in the spallation target, interacting with the walls of the experimental area. The same simulations attributed a smaller contribution to scattered neutrons. An assessment of the impact on the already approved n\_TOF-experiment by this elevated background was shown, demonstrating that the measurements outlined in n\_TOF-03 and n\_TOF-04 were no longer feasible. Some ideas to alleviate the situation were mentioned, such as additional shielding.

### **CLOSED SESSION**

Present: B. Allardyce, J. Äystö, J.-P. Delahaye\*, C. Détraz, H. Flocard (Chairman), M. Hauschild, K.-H. Langanke, K.-P. Lieb, M. Lindroos, E. Migneco\*, T. Nilsson (Secretary), H. Ravn, C. Rossi-Alvarez, B. Rubio, W. Scobel, J. Suhonen, R. Voss, D. Warner

Apologies: J.-P. Duraud, J.-P. Riunaud, H.-J. Kluge, J.A. Rubio

\*)part-time

#### 1. INTRODUCTION

The Chairman opened the session and announced a re-arrangement of the agenda. The minutes of the eighth meeting were then **approved** without changes.

#### 2. Discussion on the delivered scientific and technical reports

##### 2.1 ISOLDE Technical Report

The Committee expressed its appreciation of the handling of the situation related to the front-end break-down and that a spare unit is soon to be operational. It took note of the progress of the ISOLDE consolidation project and the staff changes.

In this context it was pointed out by J.-P. Delahaye that the PS division had no resources to operate REX-ISOLDE in the current situation and that the organization for this was still to be defined. The ISOLDE and REX-ISOLDE collaborations were requested to define what is required to operate REX-ISOLDE on a normal basis in view of a discussion on future operation in accordance with the MoU.

##### 2.2 ISOLDE Scientific Report

The Committee pointed out that the operation during the last few months had demonstrated that the investments made earlier in the HRS had been justified since a large part of the experimental programme could be transferred to this separator after the break-down of the GPS front-end. It took note of the effort to re-arrange the program. It also took note of the recent progress made with the charge-breeding in

REX-ISOLDE. In the ensuing discussion it was mentioned that the progress of reaching higher mass resolution of the HRS had been hampered by the extensive use of the separator for the scientific programme, but that the experience gained by the intense operation was very valuable.

### 2.3 Report on new safety implementations in the ISOLDE hall

The Committee took note of the ongoing effort in these matters and expressed its strong support for these measures in view of the long-term operation of the facility.

### 2.4 n\_TOF status report

The Committee acknowledged the results concerning detectors and DAQ and congratulated the collaboration on the progress of these matters.

The implications of the background problem were discussed at length. The status report was considered as an integral part of the ongoing monitoring process of the experiment n\_TOF2. The Committee acknowledged the efforts of the collaboration to assess the extent and the spatial characteristics of the background. The Committee took note of its impact on experiments n\_TOF03, n\_TOF04 and more generally on the n\_TOF programme. On the other hand, the information presented to INTC, did not contain conclusive evidences on the origin of the background and accordingly no specific remedies had been proposed. It also appeared that the recent insights on the background issues resulted more from the initiatives of small groups than from a concerted global effort of the n\_TOF collaboration. Thus, the INTC encourages the collaboration to organize within itself a dedicated structured effort up to this difficult challenge. Practically, the INTC decided that the experimental programme within n\_TOF2 is not concluded. Rather, it is considered to be reoriented with a specific focus on the background issue. Thus, the Committee requested that the collaboration submit documents describing the measures by which it plans first to progress towards the clarification of the background issue and second to ultimately resolve it. In order to speed up the process, these documents should be submitted to INTC as they become available for online evaluation by the standing n\_TOF referees within INTC pending discussions at future INTC meetings. In particular, it appears highly advisable to make an optimal use of the PS beams before the 2001 shutdown. The SPS/PS Coordinator confirmed that following a positive review, a limited number of protons could be delivered to n\_TOF within the current period of operation.

The INTC also reminds the collaboration that approval of experiments **n\_TOF03 and n\_TOF04 is still pending** awaiting the designation of a spokesman and a contact person.

## 3. Discussion on Proposals and Letter of Intent

### 3.1 **P-145** (CERN/INTC 2001-025): Measurements of Fission Cross Sections for the Isotopes relevant to the Thorium Fuel Cycle

Based on the review by two external and two internal referees the proposed topic was considered scientifically highly interesting. Moreover, the Committee acknowledged the performance of the PPAC detector systems. Nevertheless, it considered the measurements not advisable in the present background situation. In addition, a number of specific technical and organizational questions were raised which will be recorded in a separate document sent to the spokesmen of the proposal. The answers to these questions will be submitted to INTC as an addendum to P145 to be discussed in a forthcoming INTC session. Pending this discussion, a decision on P145 was **postponed**.

3.2 **P-143** (CERN/INTC 2001-023): Charge Breeding of Radioactive Ions in an Electron Cyclotron Resonance Ion Source (ECRIS) at ISOLDE

The proposed charge-breeding tests with an ECRIS source were discussed in the framework of the EU network aiming at such development and implications for future Radioactive Ion Beam facilities. The direct comparison between charge-breeding of a wide range of radioactive species in an EBIS and an ECRIS source was found to be exclusively possible at ISOLDE and the Committee thus found good reasons to **recommend** 15 shifts for further approval by the Research Board. Nevertheless, it expressed its concern that the installation would block one beam-line primarily used by the Condensed Matter community for collections and urged the involved parties to make efforts to preserve this possibility. Furthermore, it was pointed out that no resources for the installation could be expected from the PS-division and the INTC insisted that this installation should not slow down the progress of REX-ISOLDE.

3.3 **P-144** (CERN/INTC-2001-024): Studies of the Beta-Decay of Sr nuclei on and near the N=Z line with a Total Absorption Gamma Ray Spectrometer

The Committee found the experiment viable and interesting. The ability of concluding the nuclear deformation from the Gamow-Teller strength distribution was discussed, as well as the implications of deformation for the rp-process. Although the comparison to theory was not considered completely unambiguous, the proposed measurements could clearly yield information on nuclear shapes. The decision was hence to **recommend** a 13 shift allocation to the Research Board.

3.4 **P-134 Add. 1** (CERN/INTC 2001/027): Exploring the dipole polarizability of  $^{11}\text{Li}$  at REX-ISOLDE

The spokespersons of P134 had sent a letter of clarification in response to the questions raised in the sixth meeting. The Committee found that herewith satisfactory answers were given regarding the questions on the statistical and systematic uncertainties, and that the outlined measurement would be superior in probing the E1-strength distribution of  $^{11}\text{Li}$  compared to earlier measurements. Based on this, the Committee will forward its recommendation of 24 shifts. Pending completion of REX-ISOLDE, the feasibility of the experiments was still unclear, but the **Committee took note** of the commitment expressed by the collaboration to participate in the necessary technical development of light, short-lived beams with adequate intensity and purity.

3.5 **P-138 Add. 1** (CERN/INTC 2001-026): .On feasibility of  $^{48}\text{Ar}$  experiment

In a letter from the spokesperson of P134 the questions raised by the Committee in its eighth meeting were answered. The Committee found that satisfactory answers were given regarding the questions expressed in the previous meeting and 12 shifts will be **recommended** to the Research Board.

3.6 **I39** (CERN/INTC 2001-022): Production of a  $^7\text{Be}$  sample for neutron-induced cross-section measurements

The succinctly outlined physics case presented in this letter of intent did not appear to lead to high scientific benefits. It was not considered to be sufficiently convincing to motivate a test experiment. Thus, the requested shift allocation **will not be supported**.

#### 4. OTHER BUSINESS

The Chairman presented the rationale for an external audit of the solid state physics activities pursued at ISOLDE as proposed by the Research Board in its 153<sup>rd</sup> meeting. He also outlined the planned audit procedure that had been laid down following discussions with the community in question. In the following discussion on assessing scientific output, R. Voss highlighted the rule that all publications related to the use of CERN facilities should be registered at CERN and asked the Committee to remind the community of this fact.

The next meeting is on **Monday November 26**, and the deadline for submission of proposals is **Friday, October 19, 2001**.

The provisional dates of the INTC **meetings in 2002** are:

25-26 February  
13-14 May  
23-24 September  
25-26 November

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