

ISOLDE AND NEUTRON TIME-OF-FLIGHT
EXPERIMENTS COMMITTEE

Minutes of the seventeenth meeting
held on September 29th 2003

OPEN SESSION

The Chairman, Juha Äystö opened the meeting, announced the agenda and called on the ISOLDE Technical Coordinator, Mats Lindroos. Among the subjects covered in his report were the planned building extensions of the ISOLDE experimental hall and target handling building, REX-ISOLDE integration into the AB division, manpower changes and recent advances in understanding the ISOLDE beam optics. The renovation of the HRS front-end was reaching completion, and an outline for the forthcoming shutdown works was shown.

The ISOLDE Scientific Coordinator, Thomas Nilsson, gave a brief overview of the 2003 operation up to this point and indicated several small adjustments to the physics schedule. The renovated HRS front-end provides the opportunity to operate the facility in push-pull mode for the last 1.5 months of the 2003 operational period. However, although the planned upgrade of REX-ISOLDE to 3.1 MeV/u had proceeded to plan with regards to an additional accelerating structure, delays in the delivery of the RF-system made operation at the higher energy unlikely in 2003.

Klaus Blaum delivered a status report (INTC-2003-030/SR-001) on the IS413 ISOLTRAP experiment after the first year of data taking since approval.

The 2003 experimental campaign at nTOF was reported on by Alberto Mengoni. Capture measurements had been performed for a large number of targets until September, after which a row of fission measurements had ensued. The plans for 2004 are to install a 4π -calorimeter for further measurements on actinides, pending the acceptance of a proposal to be submitted to the following meeting. Claude Détraz reiterated that the nTOF Collaboration should consider its future plans, in conjunction with enlarging the user basis.

The following proposals were then presented:

1. Studies of electric dipole moments in the octupole collective regions of heavy Radiums and Bariums; INTC 2003-027/P127 Add.1: Henrik Mach
2. Inelastic branch of the stellar reaction $^{14}\text{O}(\alpha,p)^{17}\text{F}$; INTC 2003-026/P178: P.J. Woods

CLOSED SESSION

Present: J. Äystö (Chairman), P. Butler, T. Butz, P. Cennini, E. Chiaveri, J.-P. Delahaye, C. Détraz*, H. Doubre, M. Hauschild, D. Hilscher, M. Huyse, H.-J. Kluge, K. Langanke, M. Lewitowicz, M. Lindroos, E. Migneco, T. Nilsson (Secretary), E. Radermacher, M. Streit-Bianchi (replacing J.A. Rubio), J. Suhonen, D. Warner

Apologies: F. Priolo, H. Ravn

* Part-time

1. INTRODUCTION

The Chairman opened the session by welcoming the new members, Tilman Butz, Hubert Doubre, Mark Huyse, Dieter Hilscher and Francesco Priolo. He then, as a general remark, expressed his satisfaction with the progress at both the nTOF and ISOLDE facilities, highlighting the imminent building extensions at the latter. The INTC matters at the 164th meeting of the Research Board were reported back to the Committee. The Chairman then pointed to the importance of having the approved experiments providing feedback to the Committee and mentioned the report presented from the ISOLTRAP Collaboration as an example that will be followed by others.

The minutes of the sixteenth meeting were approved without changes.

2. DISCUSSION ON THE DELIVERED SCIENTIFIC AND TECHNICAL REPORTS

ISOLDE Technical and Scientific report

The Committee took note of the technical progress at ISOLDE and expressed its satisfaction. It noted the progress of the scientific programme, and in reply to a question on how the delays in the REX-ISOLDE energy upgrade would influence the feasibility of the scheduled experiments, T. Nilsson pointed out that these were approved on the basis of the existing energy of 2.2 MeV/u.

nTOF Scientific report

The Committee expressed its satisfaction with the presentation given in the open session and took note of the achieved results. The integrated proton flux delivered to nTOF during 2003 had so far been according to expectations. All measurements performed until this point had been part of the deliverables stated in the EU contract. Some planned targets had not been measured since they were unavailable or impossible to handle correctly at CERN.

A discussion on the future of the nTOF scientific programme ensued, where C. Détraz highlighted the crucial role of the Committee as the body making recommendations to the forthcoming management. K. Langanke informed the Committee that the astrophysics community is now becoming increasingly aware of the existence and capabilities of the facility.

IS413 Status report

The Committee was impressed with the multitude of new or improved masses obtained within the first part of the project but noted that the original proposal had encompassed even longer isotopic chains and encouraged the team to pursue this goal. The case of neutron-rich Ni was evoked, where going even further from stability would be extremely important but currently not possible due to low production rates and isobaric contaminations. Any development to improve this situation would be highly desirable. The Committee took note of the progress and the imminent plans to retune the experimental device towards light masses. However, the Committee expressed its wish that the mid-mass region be revisited, in view of the large amount of important measurements still to be done.

3. DISCUSSION ON THE OPEN SESSION

The presentations of the new proposals made during the open meeting were then discussed.

P127 Add. 1 (CERN/INTC 2003-027): *Studies of electric dipole moments in the octupole collective regions of heavy Radiums and Bariums*

This addendum concerns electric dipole moments in the neutron-rich Ba isotopes, subdivided into two parts where the first concerns beams already available at ISOLDE and the second a test requesting a minor target development. The region of heavy Ba isotopes was seen to be a good case for studying octupole and quadrupole collectivity. The physics case was considered solid and the experiment feasible, although the proposed set-up was not optimized to gain full spectroscopic information on the nuclear states in question and input from other measurements will be needed. Thus, the Committee recommended 15 shifts for this part. The requested re-development of a uranium carbide graphite cloth target, a type that already had been successfully operated at the ISOLDE-SC, was discussed. The potential for this and other experiments requesting short-lived neutron-rich beams was seen as large, hence, the Committee recommended that such a target be constructed for on-line tests.

P-178 (CERN/INTC 2003-026): *Inelastic branch of the stellar reaction $^{14}\text{O}(\alpha,p)^{17}\text{F}$*

The experiment aims at studying the astrophysically important reaction $^{14}\text{O}(\alpha,p)^{17}\text{F}$ in time reverse kinematics, using the upgraded REX-ISOLDE facility at 3.1 MeV/u. The interest stemming from astrophysics was clearly identified by the Committee, both concerning X-ray bursts and the matter flow from the CNO cycle to heavier nuclei. The Committee judged the proposed experiment favourably and recommended an allocation of 15 shifts. Furthermore, in view of possible competitors, a timely scheduling was called for. Since the ^{17}F beam would need a certain development effort, the proponents were encouraged to participate in this.

4. A.O.B.

P-172 (CERN/INTC 2003-015): *Coulomb excitation of a neutron-rich ^{88}Kr beam-search for mixed symmetry states*

This proposal was deferred in the fifteenth meeting pending further clarification from the spokesperson. The latter had communicated convincing arguments to the referees and the Committee regarded the project positively. However, it adjusted the requested shift allocation to 24 shifts which will be recommended to the Research Board.

I-046 (CERN/INTC 2003-022): *Transferred Hyperfine Fields at Se and Sb in a Possible Magnetic Semiconductor at Room Temperature*

This letter of intent concerns investigations of possible magnetic semiconductors. Although the document did not fully clarify the potential understanding of the structure of these materials gained from the proposed measurements vis-à-vis other methods, the Committee encourages the proponents to test the methods and looks forward to a full proposal. It was pointed out that other CERN groups, active within semiconductor development, and the ETT division could have interest in the proposed investigations.

I-047 (CERN/INTC 2003-025): *High Power Target Tests at the CERN-Isolde Target Stations*

The authors of this letter of intent propose to perform tests relevant to high-power mercury targets. The current project is focussed on the needs of such targets for Spallation Neutron Sources but has evident synergies with targets considered for EURISOL and neutrino sources. Installation of a full-scale mercury loop in the ISOLDE target area is proposed, necessitating the temporary removal of one of the front-ends. The Committee agreed with the proponents that the ISOLDE target area would probably be the world-wide best choice for the measurements in view of the available beam power, repetition frequency and shielding. However, it concluded that performing the tests during the normal operational period of ISOLDE would mean a serious disruption to the scientific programme. Thus, concurring with the proponents, the Committee urged the CERN accelerator sector to make a feasibility assessment and provide a full cost estimate for running the tests within the yearly shutdown period. The Committee encourages the proponents to submit a carefully prepared proposal, emphasizing its preference towards using the shutdown period.

I-048 (CERN/INTC 2003-028): *Laser spectroscopic studies with an RFQ cooler-buncher*

This letter of intent proposes to use the RFQ cooler currently under construction at ISOLDE for extensive laser spectroscopic studies of short-lived nuclei. The Committee considered the proposed method a straightforward way to access measurements far from stability, well proven at other RIB facilities. It took note of the presented documents and expressed its support for rapid installation and commissioning of the RFQ cooler as a beam improving device from which several experiments would benefit from. The Committee encourages the proponents to submit a full proposal on the subject.

The next meeting is on **Monday November 24, 2003** and the deadline for submission of proposals is **Friday, October 24, 2003**.

The dates of the INTC meetings in 2004 are:

23-24 February

24-25 May

20-21 September

15-16 November

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