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

Minutes of the first meeting on
Monday 27th September, 1999

OPEN SESSION

After a few words of welcome to the first meeting of the newly constituted ISTC committee, the ISTC Chairman Hubert Flocard paid tribute to his predecessor, Achim Richter, who for six years has fulfilled the post of ISC chairman with great distinction and farsightedness. He then introduced the CERN Research Director, Claude Détraz, who reviewed the new role and mandate of this new committee, which has been formed to examine and monitor the research programme of both the ISOLDE and (from April 1999) the neutron Time-Of-Flight (nTOF) facilities.

C. Détraz outlined the new role of the ISTC as an extended committee to take responsibility for monitoring proposals concerning the overlapping fields of physics covered by these two facilities. He pointed out that they will become key players in the CERN research programme between 2000-2005. During this waiting period for the first LHC beams, CERN's scientific activity will decrease for the first time in decades. This constitutes a difficult and crucial period in the organisation's history, and the ISOLDE and nTOF programmes will play a correspondingly greater role in the general perception of CERN in the member states and worldwide. C. Détraz thanked both old and new members of the committee for assuming their part of this burden. He saw immediate tasks and difficulties confronting the ISTC on both the ISOLDE and the nTOF side. The backlog of some 2 years of ISOLDE shifts must now be seriously addressed as well as the problem of bringing the High Resolution Separator, to its full capacity, and he suggested that the ISTC might profitably review priorities in both these matters. Concerning the nTOF side he stressed the difficulties of going from a project backed by an enthusiastic community of physicists and by the CERN Research Board, to a facility functioning on a day to day basis, the experimental programme of which must necessarily be subject to constant evaluation and review.

N. Pavlopoulos then presented a general view of the nTOF facility, pointing out its current threefold aim as a research instrument for studies of stellar nucleosynthesis, nuclear technology and dosimetry, and nuclear physics and the properties of the neutron. With a beam flux on target of 2×10^{13} protons in a 24 GeV 6 ns pulse, this constitutes a prolific source of neutrons in comparison with other neutron facilities. These advantages are combined with low gamma and charged particle backgrounds and a neutron energy resolution better than 1 percent over the whole energy range from 1 eV to 250 MeV. A full technical design report will be presented to the ISTC at a forthcoming meeting, together with proposals for evaluating the nTOF's performance.

M. de Saint-Simon then presented a summary of the Audit report of the ISOLDE High Resolution Separator. This had been requested by the ISOLDE collaboration and was authored by M. de Saint Simon himself and N. Severijns. He discussed the performance of the HRS

- a) in a "routine operation mode" without high order corrections, characterised by a typical resolution $M/\Delta M = 6000$, and
- b) in a "high resolution mode", including high order corrections and with a mass resolution of 15000, which would clearly be beneficial to many experiments.

The authors conclude that mode a) should first become truly routine, and that b) which is also strongly needed is indeed feasible. To implement these two steps, both technical and structural components are needed. The technical ones are at hand, but the structural ones involve careful planning, adequate technical support, a choice of priorities and clear definition of responsibilities.

Three short status reports followed. H. Ravn, ISOLDE technical Group Leader concentrated on ISOLDE beam maintenance and development, with reference to the IS343 RIST target, which has improved the ^{11}Li intensity by a factor of 10 to 30000/microCoulomb, and to the booster energy increase to 1.4 GeV with a concomitant intensity increase from $3.3\text{E}13$ to $3.9\text{E}13$ per pulse. The latter results in both gains and losses in the formation cross-sections, and tests with 600 MeV protons are planned. T. Nilsson presented the ISOLDE coordinator's report and concluded that in spite of various technical problems, the original 1999 schedule had been followed well, with the number of outstanding shifts being reduced by 115. Finally E. Radermacher, nTOF technical group leader, briefly described the present status of the PS beam, lead target and time of flight tube, the three parts making up the nTOF facility. The present plan foresees that the installation work will be finished by April 2000.

The closed meeting ended with a presentation of two new ISOLDE proposals:

P113: Decay study for the very neutron-rich Sn nuclides, $^{135-140}\text{Sn}$ separated by selective laser ionization.

P114: Investigation of the single particle structure of the neutron-rich sodium isotopes $^{27-31}\text{Na}$.

CLOSED SESSION

Present: B. Allardyce, J. Aystö, C. Détraz, J.-P. Duraud, J. Eades (Secretary), H. Flocard (Chairman), K.P. Lieb, T. Nilsson, H. Ravn, C. Rossi-Alvares, B. Rubio, G. Sletten, P. van Isacker, R. Voss, P. Walker.

Apologies: W. David, K.L. Kratz, E. Migneco, W. Scobel.

The Chairman opened the meeting by welcoming new members of the committee, and the minutes of the last ISC meeting were approved without change.

In discussing C. Détraz's presentation to the Open meeting, the committee's attention was particularly drawn to the ISOLDE backlog of shifts, which is at the moment large compared to a typical annual shift allocation. It was agreed that it is appropriate to respond to this situation by devoting part of the November closed session to a closer look at the overall nature of the backlogged experiments. It will be useful to know how they are distributed among those ready to take data, those having used up part but not all of their allocation, those waiting for REX-ISOLDE anyway, those not yet ready to take data, etc. The Chairman will therefore consult with the ISOLDE coordinator, Thomas Nilsson, and assign various committee members to take a closer look at these several classes.

The ISOLDE HRS Audit report by M. de Saint-Simon was received as one of the keys to unblocking the shift situation mentioned above. In view of this, the committee agreed that the ISOLDE technical group should concentrate on realising the first HRS mode (routine operation at relatively low resolution) as soon as possible. H. Ravn estimated that 1 MY of manpower would be enough to achieve this goal in time for the next year of ISOLDE operation.

Concerning the presentation of the nTOF facility, the committee was impressed by the quality of the scientific programme discussed and looks forward to seeing the technical proposal at an early date, and also to the presentation of proposals for evaluating the nTOF performance. The committee also took note of the status reports of H. Ravn, T. Nilsson and E. Radermacher with satisfaction.

The committee then proceeded to discuss the two ISOLDE proposals presented in the Open session:

P113: Decay study for the very neutron-rich Sn nuclides, $^{135-140}\text{Sn}$ separated by selective laser ionization.

After a short discussion the committee expressed a positive opinion concerning this proposal. The proposed measurements of half-lives and delayed neutron branching ratios should give worthwhile information on spectroscopy of very neutron rich nuclei and on astrophysical r-process nucleosynthesis beyond $N = 82$. The Chairman will therefore **recommend** to the Research Board the approval of the full requested allocation of 15 shifts.

P114: Investigation of the single particle structure of the neutron-rich sodium isotopes $^{27-31}\text{Na}$.

The committee was positively impressed by the proposed investigation of the single particle structure in neutron-rich sodium isotopes. It was agreed that the inverse kinematic technique via neutron pickup reactions was adequate and that the experiment would make efficient use of REX-ISOLDE in studies of the region around $Z = 12$ and $N = 20$. The experiment falls into two clear parts. In view of the situation regarding allocations and of the fact that a study of the four lightest isotopes should provide a good indication of the potential of the method the Chairman will for the moment **recommend** to the Research Board an initial allocation of the 12 shifts requested for the first part, after which the collaboration is encouraged to present a progress report.

OTHER BUSINESS:

The committee noted the appointment of Piet van Duppen as the successor to Gerhard Huber as Chairman of the ISOLDE collaboration.

The next ISTC meeting is on **29 November 1999**.

The dates of the 2000 meetings are:

28 February
15 May
25 September
27 November

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