EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

CERN - PS DIVISION

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SUMMARY OF THE 2nd IPHI/SPL COLLABORATION MEETING

Saclay - 10 & 11 October 2002

Editor : A. Mosnier*

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Geneva, Switzerland
11 December 2002

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1. PRELIMINARY REMARKS

According to the planning defined during the April mini-workshop at CERN [1], an IPHI/CERN collaboration meeting took place at Saclay on October 10 and 11, 2002. The agenda, as well as the list of participants are given in Annexes 1 and 2.

The goal of the meeting was to analyse the progress since the CERN mini-workshop, where the scenario to limit the IPHI RFQ at 3 MeV to allow the insertion of the CERN chopper line was adopted and a possible time-schedule was discussed. Moreover, problems with the construction of the RFQ in industry have lead to changes, which needed to be properly reported and summarised.

The opportunity was also taken to exchange information, on one hand about the status of the RFQ construction and the means to reduce its final cost, on the other hand on the context and future prospects at CERN.

2. OUTCOME

The meeting was very fruitful and significant progress was reported. Tremendous efforts were devoted in particular on the cost reduction of the RFQ and on the design of the chopper line.
The viewgraphs presented during the meeting are available on the web site of the SPL study at CERN [2].

2.1. RFQ cavity, Scenario and Planning

The main options, already discussed during the previous mini-workshop, have been re-affirmed: cw operation of the 3 MeV RFQ with an intensity of 100 mA.
Among the different schemes of cost reduction of the RFQ which were presented, the option 1 has been chosen as the most optimal one, as it permits to keep the geometry while minimizing the delays and leading to a significant cost reduction.
After the reliability tests in cw mode at Saclay, the IPHI set-up will be shipped and re-assembled at CERN with the addition of the chopper line. This set-up will then be operated in pulsed mode only, with a peak current of 40 mA and less than 1 % duty cycle.
The construction of the RFQ cavity will be completed at the beginning of 2005 and the first beam is expected at mid-2005. The reliability tests will then start at the beginning of 2006 and stop at mid-2006, followed by delivery at CERN. The detailed time-schedule is attached in Annex 3.

2.2. H- Source

Work in that field is progressing slowly, both at CERN and Saclay, with the support of the European Union. More results are expected for the next collaboration meeting.
CERN representatives underline the importance of the H- source for the future applications and strongly encourage the continuation of this work, even beyond termination of the IPHI programme.

2.3. Chopper and beam analysis lines

A large progress has been made on the chopper line and a preliminary design has been presented, including the position of the different components. Design of most equipments (bunchers, quadrupoles, chopper, beam diagnostics) is fairly advanced [2], except for the dump of the chopped beam which remains to be investigated. Beam position monitors will be of the type used in the beam analysis line.

The beam analysis line must be now designed for the energy of 3 MeV, keeping in mind that the beam diagnostics (beam current, position and profile monitors) must be operational at mid-2005 (**action : IPN**). This instrumentation has to be able to work both with the continuous beam in the Saclay test place and with the chopped and pulsed beam at CERN.

The question of the 3 MeV beam dump remains to be solved, especially for the full intensity and cw operation of the RFQ at Saclay. (300 kW beam power). The possibility of using a klystron collector has been proposed and will be analyzed in detail (**action : IPN + CEA**)

2.4. IPHI transfer to CERN and future plans

A collaboration agreement has to be prepared, describing in particular the brazing operations taken care of by CERN and the conditions of the IPHI transfer (**action : CEA**).
There is a will of CERN to participate to the tests at Saclay and of the IPHI team, including DSM and IN2P3, to participate to the tests at CERN.
The IPHI staff, required for the re-assembling and re-starting of the set-up at CERN, remains to be precisely specified.
In principle, all the hardware, specific to IPHI, will be moved to CERN. The IPHI collaboration will prepare a proposal before the end of 2002 (**action : P-Y. Beauvais**)
Beyond the present IPHI set-up (end energy of 3 MeV) the IPHI collaboration takes due note of the request of CERN for a participation of the DSM and IN2P3 Institutes to the increase in energy of the linac.

2.5. Follow-up

The next Collaboration meeting is tentatively planned for March 2003 at CERN.

REFERENCES

[1] R. Garoby, “Summary of Mini-Workshop on SPL and IPHI (April 25-26)”, CERN/PS 2002-012 (RF)
[2] http://ps-div.web.cern.ch/ps-div/SPL_SG/IPHI_SPL_Meetings/October_2002/Talks.htm

ANNEX 1: Agenda of the 2nd IPHI/CERN Collaboration meeting

Thursday 10 October

AM

9h30	Context & goals at CERN (update !)	R. Garoby
10h00	Status of IPHI construction, updated plans and schedule	P-Y. Beauvais
	Coffee break	
11h00	Visit of IPHI Hall	
12h30	***Lunch***	

PM

14h00	Cavity cost optimisation	M. Painchault
14h30	H- source	D. Kuchler
15h00	ESS and SNS H- sources, ongoing development	R. Ferdinand
15h15	RFQ design modification for 3 MeV	R. Ferdinand
15h40	Beam dynamics between 0 and 100 mA beam current (with beam losses)	R. Ferdinand
	Coffee break	
16h30	Status of development of the chopper	F. Caspers
17h00	High energy beam line and associated beam instrumentation	P. Ausset

Friday 11 October

AM

9h30	Lay-out of the 3 MeV chopper line	A. Lombardi
10h00	Buncher & RF	A. Millich, M. Vretenar
	Coffee break	
11h00	Beam Instrumentation for the chopper line	K. Hanke
11h30	Information on developments for energies above 3 MeV	M. Vretenar
12h00	***Lunch***	

PM

14h00	Preparation of the conclusions	
15h00	Summary and conclusions	A. Mosnier & R. Garoby

ANNEX 2: List of participants

CERN :

F. Caspers, R. Garoby, K. Hanke, D. Kuchler, A. Lombardi, A. Millich, M. Vretenar

IN2P3 :

P. Ausset, U. Bothner, J-L. Coacolo, D. Gardes, F. Launay, M. Lieuvin, A.C. Mueller, N. Rouviere, A. Tkatchenko

DSM :

P-Y. Beauvais, D. Bogard, P. Debu, M. Desmons, R. Ferdinand, A. France, R. Gobin, J-L. Jannin, A. Mosnier, M. Painchault, F. Simoens, Y. Terrien

ANNEX 3: Planning

N°	Nom de la tâche
1	**IPHI dans l'INB 48**
2	CLS IPHI
3	Transmission du dossier de sûreté révisé
4	Décret interministériel MAD INB 48 (ou dérogation)
5	Décret interministériel ICPE autorisée
6	Préparation du site : CDE
7	Séparation physique IPHI / INB 48
8	**Aménagements extérieurs aux halls**
9	Révision de la distribution électrique
10	Aménagement bureaux labos. et PCP
11	Révision du système de refroidissement
12	Refroidissement RFQ
13	**IPHI 100 keV**
14	Installation SILHI / LBE
15	Essais SILHI 100 keV
16	**IPHI 3 MeV**
17	Fabrication prototype RFQ
18	Fabrication des tronçons RFQ
19	Assemblage système RF, RFQ, LHE, bloc d'arrêt
20	Mise en place des protections bilogiques
21	Conditionnement HF du RFQ
22	Essais 3 MeV mode pulsé
23	Essais 3 MeV faisceau continu
24	**Tests chopper au CERN**
25	Démontage et transport vers le CERN
26	Insttallation IPHI + chopper au CERN
27	Conditionnement HF du RFQ
28	Essais 3 MeV mode pulsé