

## MINUTES of the 2<sup>nd</sup> LIBRA Meeting

held at the Institute of Nuclear Physics of NCSR "Demokritos"  
Athens, 9–10 November 2009

The second LIBRA meeting took place on November 9–10, 2009 at the Institute of Nuclear Physics (INP) of NCSR "Demokritos" in Athens, Greece. The first day (9/11/2009) was devoted to the 2<sup>nd</sup> LIBRA Users Meeting comprising three open sessions. The closed meeting of the LIBRA PAC was held on the morning of the next day (10/11/2009). A joint dinner was organised in the evening of the first day. A participants list of the 2<sup>nd</sup> LIBRA Meeting is given in Annex I. The programme of the open meeting is given in Annex II.

### Minutes of the 2<sup>nd</sup> LIBRA Users Meeting held on November 9, 2009

The open meeting started with welcome addresses by Prof. Muhsin Harakeh, Chair of the LIBRA Project Advisory Committee (PAC) followed by Dr. Sotirios V. Harissopulos, LIBRA Project Coordinator and Deputy Director of the Institute of Nuclear Physics (INP) of NCSR "Demokritos". The meeting comprised 13 oral presentations and a round table discussion. From the 13 talks, two were given by scientists representing institutes collaborating with INP within LIBRA (Project Partner Institutions – PPI) and seven by scientists representing user-groups interested in using the LIBRA facilities. In addition, three presentations were given from researchers participating in the LIBRA project and one from an invited scientist from the Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI–HAS) in Debrecen, Hungary. The detailed programme of the 2<sup>nd</sup> LIBRA Users Meeting is given in Annex II.

The first presentation of the programme was a status report of the LIBRA project given by the LIBRA coordinator Dr. S. Harissopulos. The next talk given by Prof. Andreas Zilges was a presentation of the research programme of the Institute of Nuclear Physics of the University of Cologne, a LIBRA Project Partner Institution. This talk was followed by Dr. Aliz Simon's presentation of the facilities and the research programme of ATOMKI–HAS (Debrecen, Hungary). Dr. Simon focused on the applications of the microbeam system installed at ATOMKI. In view of the acquisition and installation of a very similar system at the Tandem Accelerator Laboratory of INP within the LIBRA project, Dr. Simon highlighted additionally a number of future joint activities between INP and ATOMKI. The next speaker, Dr. Gabriel Chardin, presented the applications programme of the CSNSM in Orsay, France, which is another important LIBRA PPI and has already provided the low-energy high-current PAPAP accelerator to the TANDEM Accelerator Laboratory of INP. PAPAP was transferred from Orsay to "Demokritos" in July 2009 with LIBRA funds. The first session ended with a presentation of Dr. Srdjan Petrovic representative of a LIBRA user group from the VINCA Institute in Belgrade on the running research activities of the group at the Tandem Accelerator Laboratory of INP and the measurements planned to be carried out using the LIBRA facilities.

The second session comprised presentations of user groups. The first one was given by Assoc. Prof. George Tsipolitis representing the High-Energy Physics Group of the National Technical University of Athens (NTUA). Prof. Tsipolitis reported on the activities

of the group aiming at testing the performance of their Micromegas detector under neutron irradiations that were performed at the INP Tandem accelerator, as well as on the future activities of the NTUA High-Energy Physics Group using the upgrades planned within LIBRA. Professor Zouros from the University of Crete at Heraklion was the next speaker of the second session. In his talk, Prof. Zouros reported on the progress of the installation of his atomic physics experimental setup at the INP Tandem accelerator and the associated planned measurements within the course of LIBRA. This setup was transferred from the Accelerator Laboratory of the Kansas State University in US to the INP Tandem accelerator laboratory recently. Prof. Zouros' contribution was followed by an activity report of a user group from the Institute of Nuclear Technology and Radiation Protection (INTRP) of NCSR "Demokritos" that was presented by Dr. George Apostolopoulos. This report was focused on the measurements aiming at investigating radiation damages of Fe-Cr alloys of relevance to fusion applications. These experiments are carried out at the INP Tandem accelerator using mono-energetic neutron beams produced either by the  $p+{}^7\text{Li}$  or the  $d+d$  reactions. In the next talk, Prof. Rosa Vlastou from the National Technical University of Athens (NTUA) presented the activities of her group that also uses secondary neutron beams delivered by the TANDEM accelerator. Prof. Vlastou focused on the research planned to be carried out at the INP Tandem accelerator aiming at determining cross sections of  $(n,2n)$  reactions in actinides. These are required for the design of innovative Accelerator Driven Systems (ADS) related to the production of clean and safe nuclear energy as well as for the transmutation of nuclear waste. The session closed with a talk given by Assist. Prof. Michael Kokkoris, also from NTUA, who gave a status report on the running activities on measurements of cross sections of proton- and deuteron-induced reactions required for materials analysis.

The third and last session included 3 presentations given by Dr. Athanassios Godelitsas from the Geology Department of the National-Kapodistrian University of Athens (NKUA), and the LIBRA researchers Dr. Steven Ashley and Dr. Gert Jacob van Klinken. Dr. Godelitsas reported on his running activities related to environmental studies using ion beams from the INP Tandem accelerator. Dr. Godelitsas emphasised the importance of the microbeam system that will be installed at the INP accelerator within LIBRA for these types of studies and presented cases for future investigations requiring microbeams. The next speaker, Dr. Steven Ashley, presented the programme of the LIBRA group aiming at the measurement of lifetimes of excited nuclear states using a detector array consisting of four HPGe detectors from the "Dynamitron Detector Pool" in which the INP Tandem accelerator laboratory participates thanks to LIBRA funds. This pool is a joint initiative of INP and the Institutes of Nuclear Physics of the Universities of Cologne, Munich and Darmstadt. The last speaker, Dr. Gert Jacob van Klinken, presented finally the plans of the LIBRA Group beyond the LIBRA project. Dr. Van Klinken focused on the future exploitation of the facilities to be established by LIBRA towards climate change studies and environmental monitoring in general. The session closed with a round table discussion on the presented user group research activities and needs. The later included beam time, man power and research tools. It was agreed that various issues raised by the user groups will be considered for discussion by the PAC in its closed meeting the next day that will make recommendations to the LIBRA Coordinator, who will then inform the user groups accordingly. Before the closing of the round table discussion, the LIBRA coordinator asked the speakers of the sessions for permission to include their presentations at the LIBRA's website, i.e. <http://libra.inp.demokritos.gr>. All speakers responded positively to this request.

## Minutes of the closed meeting of the LIBRA PAC (November 10, 2009)

**Present:** Prof. D. Balabanski, Prof. M.N. Harakeh (Chair), Prof. R. Julin, Prof. R. Krücken, Prof. P.-A. Mandó, Prof. P. Misaelides; ex-officio: Dr. S. Harissopulos, the LIBRA Coordinator.

Agenda of the closed meeting of the LIBRA PAC

1. Opening of the meeting
2. Fixing the agenda
3. Minutes of the last meeting
4. Presentation of LIBRA management and development
5. Issues related to users' groups
6. Any issues related to presentations at the LIBRA Open Meeting
7. Any other business
8. Closing the meeting

1. The chairman opens the meeting and welcomes the members of the LIBRA PAC, and in particular Prof. Mandó, who could not attend the kick-off LIBRA meeting on March 11, 2009. He speaks, also on behalf of all LIBRA-PAC members, of his appreciation for the scientific programme of yesterday. The research topics presented at sister institutes that are of relevance for research at LIBRA facilities gave a good overview of the nice research that could be pursued at LIBRA in the future. Also, the topics of research that were presented by users from within and from outside Demokritos to be pursued at the Demokritos Tandem Facility showed a broad and rich programme with projects at the forefront of science that be addressed at such facilities.

2. Having no other points for discussion, the agenda is fixed.

3. The minutes of the LIBRA kick-off meeting on March 11, 2009 including those of the closed LIBRA-PAC meeting were agreed upon, after a point on page four was clarified regarding the availability of operators. The confusing statement on page 4 read: "Taking into account that many external users ask very often for night-shifts, the major part of which is undertaken by Mr. Papakostopoulos, the net result is that the Laboratory is forced to go without him for a period of almost two months at a time." The operator is compensated by a one day-off for every night-shift. However, the period of two months mentioned comprises both the days off due to compensation of night shifts as well as the vacation days to which the operator is entitled. The discussion concerning the provision of assistance to users during night shifts ensued. This is discussed below under point five.

Furthermore, a number of issues were raised as a follow-up to discussions made during the LIBRA kick-off meeting. The action plan of LIBRA activities was not communicated to the LIBRA-PAC members as planned at the end of July in order to facilitate the monitoring of LIBRA. However, the chair has been kept informed of the procedure to hire postdocs for the various activities of LIBRA.

During the last meeting Prof. Misaelides proposed to distribute a simple questionnaire to the users to survey their needs in beam-time per year and operator night-shifts. He and Prof. Balabanski will evaluate this questionnaire and present the results in this LIBRA-PAC meeting. This did not happen and no contact with the wide user community was made. However, a letter was prepared by Prof. Misaelides and sent to Greek users. The letter has been translated into English and could be sent to non-Greek users as well.

4. The LIBRA management and developments have been presented by Dr. Harissopulos during the open meeting the day before. Some of the points were put to discussion during the closed LIBRA-PAC meeting. Within Task 3.1, reports on the following items were made:

- i) Progress has been made on acquiring a  $4\pi$  NaI sum spectrometers from KVI and Bochum, but an option to buy a new and better one is presently being considered.
- ii) Development of a  $^4\text{He}$ -filled gas cell for measurement of  $\gamma$ -rays with a  $4\pi$  NaI sum spectrometer has not been done yet.
- iii) Development of a time-projection chamber (TPC) from Micromegas is going on.
- iv) An array of 16  $^3\text{He}$ -filled neutron detectors will be built.
- v) A plunger will be built in collaboration with IKP Köln.

The upgrade of the Tandem accelerator components is being now considered. This includes: vacuum, power supplies, SF<sub>6</sub> gas, remote control, new beam lines and grounding.

Task 3.3 is concerned with bringing PAPAP (Petit Accélérateur pour l'AstroPhysique) from CSNSM, Orsay and installing it at INP, Demokritos. This is a 250 kV proton, deuteron and alpha accelerator. It can deliver 0.5 mA of deuteron beam. If used in conjunction with a d-filled gas cell it can yield a neutron beam of  $\sim 10^8$  n/cm<sup>2</sup>.s at  $E_n \approx 4$  MeV, and with a tritiated solid target a neutron beam of  $\sim 10^7$  n/cm<sup>2</sup>.s at  $E_n \approx 14$  MeV. PAPAP is already at Demokritos. By the end of January 2010, it will be decided where PAPAP will be installed after the simulations for neutron safety have been done. The installation of PAPAP will be around end of February 2010 and the commissioning should be finished by the end of June 2010.

Task 3.4 has to do with ordering and installing a  $\mu$ -beam facility at INP Demokritos. Tender procedure has been done and Oxford  $\mu$ -beams Ltd has brought an offer with 170 kGBP. This will make possible to install a  $\mu$ -beam facility within budget.

The LIBRA PAC was informed that Dr. Andreas Karydas will take a sabbatical to visit the Institute for Isotope Research and Nuclear Physics in Vienna. It is quite possible that the sabbatical stay could be extended for three years. This comes at a very inopportune time for the LIBRA project. Dr. Karydas should play an important role for LIBRA, but this will surely reduce the effective manpower that is needed to push the project forward. The LIBRA PAC advises the Directorate of INP to use the money that comes free with the move of Dr. Karydas to Vienna to hire a postdoc or to invite a guest for a year to work on the project.

In this respect and considering the vibrant scientific programme that could be set up at INP Demokritos with the LIBRA project, the LIBRA PAC advises the INP Directorate to strengthen the present staff with one or two permanent positions for working on the subfields of Nuclear Astrophysics and Nuclear Structure.

The issue of having a programme advisory committee (PAC) for evaluating and prioritising the proposals for experiments at the Tandem facility was raised. Although most of the requested beam time is being accommodated in one way or another, some members of the user community have asked for such a PAC. The LIBRA-PAC is of the opinion that such a PAC is at the moment not necessary. It would become so, if the beam-time requests surpass the available beam time by 20 to 50%. As long as this is not the case yet, a PAC has no added value. A better option would be to have a scientific advisory committee, which may evaluate the scientific programmes run at the Tandem facility annually or biennially.

5. The TANDEM User-Group meeting was held the day before the present LIBRA-PAC meeting, as was agreed during the LIBRA kick-off meeting. This was very useful since the users could discuss some of the issues that concern them with the LIBRA PAC. One of the important issues for users groups is the running of night shifts. The users especially from university groups have been asking for operators during the night shifts to help with running the facility. The LIBRA PAC discussed already in the kick-off meeting the problem of lacking the man-power to run night-shifts at the TANDEM accelerator. It was again clear from the renewed discussion that it is at the moment difficult to have operators running night shifts for the reasons mentioned above, which may endanger the running of the facility as a whole. This may jeopardise the maintenance activities of the facility by the operators which may have grave consequences on the efficient running of the facility. It has been also stated that at the moment it is impossible to hire extra operators to help solve this problem because of lack of resources. However, the LIBRA PAC agreed that this situation cannot continue as is and decided after extensive discussions on the need and possibilities to solve this problem to advise the following:

- i) The Demokritos Board of governors should make a decision to allow PhD students and postdocs from university user groups and other institutes to be trained to run the facility.
- ii) The LIBRA Coordinator/Deputy Director INP Demokritos, Dr. S. Harissopulos, should together with the user community set up such a training programme. This training could be provided periodically by the Tandem staff.
- iii) A call-up system for emergencies during night shifts should be set up in parallel to ensure smooth running of the facility at night and to avoid any major breakdowns.

Dr. Harissopulos had presented the website to users. The letter prepared by Prof. Misaelides for the user community contains similar information about the website. In this way contact with the user was established. User can look for information on the website and contact Harissopulos if more information is needed. It remains important, however, to categorise the activities of the various groups and to send around a circular to users to document their needs.

6. The LIBRA-PAC members were pleased with the scientific presentations at the LIBRA Open Meeting
7. No other business is brought forward for discussion.
8. The Chair closed the meeting by thanking all members for their contributions and Dr. Harissopulos for the information furnished during the meeting.

**ANNEX I**

2<sup>nd</sup> LIBRA meeting, Institute of Nuclear Physics, NCSR "Demokritos"  
9–10 November 2009

**PAC Members**

1	Muhsin Harakeh (PAC chair)	Kernfysisch Versneller Instituut–KVI, University of Groningen, Netherlands
2	Reiner Krücken	Physik Department E12, Technische Universität München, Germany
3	Rauno Julin	Department of Physics, University of Jyväskylä, Finland
4	Dimiter Balabanski	Inst. for Nuclear Research and Nuclear Engineering–INRNE, Sofia, Bulgaria
5	Pier Andrea Mandò	LABEC, Istituto Nazionale Fisica Nucleare, Florence, Italy
6	Panagiotis Misaelides	Radiochemical Lab, Dept. of Chemistry, Aristotle University of Thessaloniki, Greece
7	Sotirios V. Harissopoulos (LIBRA Coordinator)	Tandem Lab, Inst. of Nuclear Physics, NCSR "Demokritos", Athens, Greece

**Participants**

8	Andreas Zilges	IKP – Universität zu Köln
9	Gabriel Chardin	CSNSM, Orsay, France
10	Anne Lefebvre–Schuhl	CSNSM, Orsay, France
11	Aliz Simon	ATOMKI–HAS, Debrecen, Hungary
12	Srdjan Petrovic	VINCA Institute, Belgrade, Serbia
13	Rosa Vlastou	Department of Physics, National Technical University of Athens, Greece
14	Yorgos Tsiopolitis	Department of Physics, National Technical University of Athens, Greece
15	Michael Kokkoris	Department of Physics, National Technical University of Athens, Greece
16	George Apostolopoulos	INTRP, NCSR "Demokritos", Athens, Greece
17	Maria Zamani–Valasiadou	Aristotle University of Thessaloniki, Thessaloniki, Greece
18	Marianthi Fragkopoulou	Aristotle University of Thessaloniki, Thessaloniki, Greece
19	Theo Tzouros	Department of Physics, University of Crete, Heraklion, Crete, Greece
20	Athanasios Godelitsas	Dept. of Mineralogy and Petrology, University of Athens, Greece
21	Konstantinos Potiriadis	Hellenic Commission of Atomic Energy
22	Andreas Karydas	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
23	George Fanourakis	Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
24	Vivian Demetriou	Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece

25	Gert Van Klinken	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
26	Tassos Lagoyannis	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
27	Theo Mertzimekis	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
28	Michael Axiotis	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
29	Miltiades Andrianis	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
30	Th. Konstantinopoulos	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
31	Vicky Kantarelou	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
32	Dimosthenes Sokaras	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
33	Varvara Foteinou	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece
34	George Provatas	Tandem Accelerator Laboratory, Institute of Nuclear Physics, NCSR "Demokritos", Athens, Greece



## ANNEX II

Programme of the 2<sup>nd</sup> LIBRA meeting, Institute of Nuclear Physics, NCSR "Demokritos"  
9–10 November 2009

<u>NOVEMBER 9, 2009</u>		
08:45 – 09:00	Welcome addresses by Prof. Muhsin N. Harakeh, LIBRA–PAC Chair, and Dr. Sotirios Harissopoulos, INP–"Demokritos", Deputy Director and LIBRA coordinator	
<b>1<sup>st</sup> Session</b>	<b>Chairman</b>	<b>Muhsin N. Harakeh</b>
<b>TIME</b>	<b>SPEAKER</b>	<b>TITLE</b>
09:00 – 09:30	<b>Sotirios Harissopoulos</b> (INP – "Demokritos")	Status of the LIBRA project
09:30 – 10:00	<b>Andreas Zilges</b> (IKP – Universität zu Köln)	Symmetries, lifetimes and the synthesis of nuclei
10:00 – 10:30	<b>Aliz Simon</b> (ATOMKI–HAS, Debrecen)	Novel applications in ion microbeam analysis
10:30 – 10:50	<b>Gabriel Chardin</b> (CSNSM, Orsay)	Research activities at CSNSM
10:50 – 11:10	<b>Srdjan Petrovic</b> (VINCA Institute, Belgrade)	High energy proton de–channelling in silicon crystals
<b>11:10 – 11:40</b>	<b>COFFEE BREAK</b>	
<b>2<sup>nd</sup> Session</b>	<b>Chairman</b>	<b>Pier Andrea Mandò</b>
11:40 – 12:00	<b>George Tsipolitis</b> (NTUA, Athens)	The ATLAS Micromegas project
12:00 – 12:15	<b>Rosa Vlastou</b> (NTUA, Athens)	Neutron cross sections on actinides
12:15 – 12:30	<b>George Apostolopoulos</b> (INTRP –"Demokritos")	Radiation damage in Fe–Cr alloys for fusion applications
12:30 – 12:45	<b>Theo Zouros</b> (U. Crete)	Electron transfer into metastable He–like ions: Non–statistical population mechanisms
12:45 – 13:00	<b>Michael Kokkoris</b> (NTUA, Athens)	Differential cross section measurements for EBS and NRA in the framework of the LIBRA project
<b>13:00 – 15:00</b>	<b>LUNCH</b>	
<b>3<sup>rd</sup> Session</b>	<b>Chairman</b>	<b>Dimiter Balabanski</b>
15:00 – 15:20	<b>Athanasios Godelitsas</b> (U. Athens)	Recent progress in application of "Demokritos" Tandem Accelerator to Earth and Environmental Sciences
15:20 – 15:40	<b>Stephen Ashley</b> (INP –"Demokritos")	Aspects of lifetime measurements in the LIBRA framework
15:40 – 16:00	<b>Gert Jacob van Klinken</b> (INP –"Demokritos")	LIBRA: The day after
16:00 – 17:00	LIBRA Users meeting	<b>Chairman: Dimiter Balabanski</b>
<u>NOVEMBER 10, 2009</u>		
09:30 – 13:00	<b>LIBRA–PAC Meeting (Closed session)</b>	