**Minutes**

**Internal Seminar**

**13.10.2015**

Participants:

Mihai Ciubancan, Mihai Cernaianu, Yi Xu, Guangling Chen, Catalin Miron, Florin Rotaru, Ioan Dancus, Nicu Stan, Catalin Balan, Abdullah Coban, Nikolay Djourelov, Ioana Gheorghe, Marius Gugiu, Paul Constantin, Ioan Garagaianu, Daniel Popa, Liviu Neagu, Theodor Asavei, Mariana Bobeica, Dorina Aranghel, Teodor Ivanoaica, Ovidiu Tesileanu, Piotr Tracz, Gabriel Suliman, Violeta Iancu, Loris D’Alessi, Emil Udup, Wen Luo, Gheorghe Acbas, Petru Ghenuche, Keita Seto, Septimiu Balascuta, Teodor Dogaru, Danilo Gambacurta, Luigi Capponi, Soiciro Aogaki, Zafar Yasin, Cristian Savlovschi, Catalin Matei, Dan Filipescu, Marian Toma, Florin Negoita, Daniel Ursescu, Calin A. Ur, Dimiter Balabanski, Cristian Petcu, Bertrand de Boisdeffre, Alexandru Boianu, Bogdan Tatulea, Valeriu Buznea, Jasmeet Kaur, Victor Leca, Andreea Oprisa, Razvan Dabu, Ewa Tracz.

The seminar is conducted by the Scientific Director, Prof. Sydney Gales.

1. New members of ELI-NP Project

Prof. Gales introduced new members of ELI-NP, that joined the project since the last internal seminar.

* Dan Stutman – researcher in RA3, he will work on development of diagnostics. He works also at John Hopkins University.
* Yi Xu – worked as post doc at Texas University, then also in Czech Republic in the field of nuclear astrophysics, now he is part of RA4 group.
* Luigi Capponi – did his PhD in Scotland in the field of nuclear physics, he has experience in gamma spectroscopy. He will be member of RA4 and will work on ELIADE.
* Guangling Chen – is part of RA2, working on control system and applications. She did her PhD in Shanghai (China), she worked in the past also as software engineer.
* Teodor Dogaru – research assistant in RA2, did his PhD in North Carolina (USA), worked on magnetic field imaging.
* Danilo Gambacurta – did his PhD at Catania University, now he is theoretician in RA4.

1. Prof. Gales presented the purpose of this internal seminar:

* We should have continuous information flow and knowledge of what is happening in the Project, we should also get in preparation of experiments. Prof. Gales said that he is open to any new suggestions, so everybody can discuss or write about them to Prof. Gales.

1. **Status of HPLS construction – mile stones and planned commissioning steps – A. Boianu**

* HPLS contract phases are presented
* Intermediate stage I (Nov. 2014) – pump lasers for laser arm A
* Stage I (end 2015) – equipment for laser arm A; full delivery is expected by December 2015
* Intermediate Stage II (mid 2016) – one functional laser arm A
* Stage II (end 2016) – two functional laser arms A and B
* RA1 team made already some acceptance tests in France
* In 6-8 months from now hopefully complete laser arm will be ready
* LBTS
* RA1 members made some visits and talks with people from:
* CALA – facility in Munich (Germany)
* Apollon – facility in France
* Thanks to these visits more knowledge has been gathered on the needs for ELI-NP laser transport system
* But in order to understand better and make final decision on LBTS System there is a plan to organize a workshop with LBTS users by December 10, 2015.

Discussion after the presentation

* Dan Stutman asked about laser contrast.
* Alexandru Boianu replied that according to the contract it should be 1013.
* Second question aimed the complexity of Apollon LBTS system comparing to ours.
* The answer was, that their LBTS system in a bit more complex.
* Razvan Dabu made a comment on the transport system, in his opinion last tender was well done, but:
* People wanted more problems to be solved in this tender than only transport of laser beam
* In evaluation criteria some not suitable criteria were introduced.
* With these two mistakes corrected, in opinion of Razvan Dabu, the tender will be successful.
* Dr. Catalin Miron asked about time window of the contrast
* Razvan Dabu replied that it is 50-100 picoseconds before the pulse
* Prof. Gales said that it is important to have good contrast to carry out our physics.

1. **Status of EuroGammaS – milestones and planned commissioning steps – C. A. Ur**

* Calin A. Ur: we are approaching end of Stage I.
* Since the last internal seminar there were two technical meetings with EuroGammaS:
* July 22nd-23rd in Daresbury
* September 21st – 22nd in Magurele
* Calin A. Ur said that the meeting in Daresbury was especially important because that was a chance to see how they are proceeding with their part of work (vacuum science activities, RF activities – discussions on electron accelerator technology)
* ELI-NP members visited three accelerators in Daresbury:
* VELA – modulator injector
* CLARA – development of know-how in FEL technology
* ALICE – based on Electron Recovery Linac
* And also visited:
* Mechanical workshop (mounting of modules M4 and M4A, alignment with laser tracker)
* Electronics workshop
* Vacuum workshop
* Calin A. Ur presented drawings of Module 4
* People from Daresbury proposed concept of transport method – described by Calin A. Ur
* Transportation of this module is EuroGammaS task.
* Training:
* Mechanical mounting of vacuum at INFN (Frascati) – Bogdan Tatulea, Emil Udup, Ioan Garagaianu
* Magnets at INFN – Cristian Paun
* Laser transport lines at LAL Orsay – Marcel Conde
* RF – training will be conducted in the beginning of next year
* Status of work packages is presented by Calin A. Ur:
* WP02 – laser and optics (at HIGS they made simulation of time structure of our beam with use of diamond detector).
* WP03 – accelerator structures – RF
* WP06 – INFN Modules
* WP08 – control system
* Calin A. Ur informed that they proposed new solution for control room, suggesting to divide it in two parts, which can cause some problems in terms of fire extinguish system and air conditioning system.
* EuroGammaS expect all equipment due for the end of this year to be delivered.
* Calin A. Ur presented details of deliverables for the end of Stage I.
* Calin A. Ur mentioned that EuroGammaS must provide also documentation for all components at the end of Stage I.
* Calin A. Ur informed that, because of the building delay the acceptance will be done in few places abroad (Italy, France, Great Britain, Sweden).
* Prof. Gales gave information (not official, as the new date in contract is not signed), that the building construction is expected to be ready around March 2016.

1. Gammas beam experimental areas E2 and E8. NRF Experiments with GBS – Presentation by Calin A. Ur

Infrastructure and location of the NRF experimental setup were presented:

* E2 – low energy up to 1,5 MeV
* E8 – high energy up to 19,5 MeV
* CAD designs are being built for infrastructure
* Parameters of gamma beam were described by Calin A. Ur
* Photonuclear reactions – some examples were presented
* Photoresponse of nuclei

NRF theory

* Cross sections, Energy integrated cross section, Transition strengths Polarized photon beam
* Angular Distributions and Parity and Polarization
* For performing these measurements described by Calin A. Ur, 4 pi Gamma Clover and segmented Ge detector array ELIADE system will be used
* Mechanical design for detector is presented
* Mechanical support, GEANT 4 simulations, DAQ
* ELIADE placement in experimental (E2) hall is shown
* Work packages status is discussed
* Calin A. Ur mentioned also about NRF and GBDD Workshop, which was held on October 6-7, 2015
* He presented topics discussed during the workshop
* Small group of invited experts participated to the workshop
* The workshop ended with recommendations for implementation of the day one expts based On NRF and GBDD TDR’s

Conclusions from the presentation made by Calin A. Ur

* For NRF we got information about: physics features and background, measurement tools, status of the topic. This allowed us to have updated, continuous review of the issue.

1. **HPLS experimental area E1. Planned science and instruments. How to prepare the commissioning phase and day one expts in this expts areas – Florin Negoita**

Florin Negoita presented the following topics:

* Fission-Fusion expts
* Nuclear reactions in Plasma – study of screening factor in nuclear reactions of astrophysical interest. Proposal of S. Tudisco et al.
* Study of screening factor – The method and cases
* Nuclear (de-)excitations in plasma – proposal of F. Hannachi et al.
* ISAB recommendation for HPLS – TDR1
* Updating the TDR1 following the ISAB recommendations
* Conclusions and Laser Requirements NOT CHANGED
* Implementation timelines – version March 2015

Discussion after the presentation:

* Prof. Gales proposed to have discussion on the problem of how to characterize high power laser for not only acceleration of protons.
* Then Prof. Gales discussed with Florin Negoita about the feasibility of presented experiments.

Conclusions and important information

* Prof. Gales said that it would be very useful to have a serie similar type of internal seminar also on physics case in all others experimental areas – suggested date for the next meeting : between mid-November and mid-December, 2015.
* He also informed about the radioprotection classes, which will be organized soon. All members of ELI-NP are obliged to participate to those classes to obtain necessary authorization that will allow them to enter in the experimental hall and/or to work with radioactive sources. This is the rule for all such facilities in the world. Further information on that issue will be given. The classes will be done in two or three groups.
* Prof. Gales reminded that by December 15th all travels and mandates should be completed, as beyond that date it will be impossible to make any payments.
* Prof. Gales announced the General Seminar dedicated to administrative issues, which will be held on October 27th, 2015, all ELI-NP members are invited to attend.

Drafted by: Ewa Tracz