

Special Interest News:

- DITANET Prize Winner Announced
- School on Complementary Skills

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Exciting Times

2010 started very excitingly for the network: Interesting research results on beam halo measurements were reported for example from collaboration between partners in Maryland, VIALUX, Thermo Fisher, CERN and Liverpool. These might open up routes to measure beam halo with very high precision and to thus benchmark beam dynamics simulations.

A school on complementary skills brought together all network trainees in March. Besides an intense training program, this event helped creating a nice atmosphere between all early stage and experienced researchers within the network.

The network had the pleasure to announce the winner its first annual prize. Following a peer review of international applications received, both from within and outside of DITANET, Frank Becker (GSI) was awarded for his work on the BIF-monitor. He explained his work in a nice presentation to the network.

The project's mid-term review meeting with the European Commission in Brussels last month. Almost two years had passed since the start of the project – a time that passed by very quickly. Attendance to the meeting was excellent and it was a pleasure to meet all partners again at the same location where the net-

work's kick-off meeting took place in 2008. The Project Officers were very pleased with the overall project progress and in particular with the seamless integration of our industry partners.

Finally, the results of the network's broad research program will be presented at the Beam Instrumentation Workshop in Santa Fe in a special talk. I would like to use this opportunity to thank the organizers for their continuing support of the project.



Carsten P. Welsch, Coordinator

DITANET Prize 2011

Applications are now invited for the DITANET Prize 2011. The Network will award a 1,000 euro cash prize for an outstanding contribution to the field of beam instru-

mentation for particle accelerators by a researcher in the first 5 years of their professional career. The deadline for applications is 31/10/2010 Full information on the application

process can be found on the DITANET web site.

www.liv.ac.uk/ditanet

Recent Events

DITANET School on Complementary Skills

Liverpool, 15th to 19th March 2010



“The workshop was not only useful, but exciting!”

“...[it] covered the most important topics for a PhD student.”



The DITANET Management, in close collaboration with a number of professional trainers and the Liverpool Graduate School, organized a Complementary Skills School at the University of Liverpool from 15th-19th March 2010. This course aimed at providing the network’s early stage and experienced researchers with the necessary skills base for a future career in both, the academic and industry sectors. After an introduction session, the participants focused on different presentation techniques and discussed best practice as well as common mistakes. They were also introduced to the University and the City of Liverpool on the first school day.

Day two started with an introduction to project management, before putting a focus on individual presentations. All participants had to give a 5 minute presentation on their research projects that was recorded and then assessed individually. On Wednesday, the school triggered discussions about the benefits from and challenges in international networking. Representatives from Tech-X UK and Inventya reported on their personal experiences, before a session on time management concluded the morning.

Wednesday afternoon the group toured the Daresbury Laboratory and the Cockcroft Institute and had the opportunity to

learn about the institute’s broad research program.

On Thursday, time and self management, a session on work/life balance as well as two hours on intellectual property rights and patent law confronted the trainees with a number of important skills and triggered many discussions. Finally, an extended session on scientific writing and a group discussion completed a week that brought together all DITANET trainees and led to many interesting and lively discussions between the trainees as well as the trainers and the management team.



Recent Events (Continued)

DITANET Mid-Term Review Meeting with the European Commission Brussels, 12th April 2010

The Project's Mid-Term Review Meeting with the European Commission took place in Brussels on Monday, 12th April. Representatives from all partner institutions and trainees were present. The Network was presented by the Coordinator

Carsten P. Welsch and each beneficiary institution presented their work. In addition, trainees were afforded interviews with the Commission regarding their roles in the Network.

Initial feedback by the EC was given by the Project

Officer who was impressed with the progress of the Network to date and delighted by the number of Associate Partners who had attended, in all 38 people from the Network were present at the Meeting.



DITANET Prize Winner 2010: Frank Becker

The DITANET Prize was awarded to Frank Becker from GSI following the Mid-Term Review Meeting on Monday 12th April. Frank presented his research which focused

on beam induced fluorescence (BIF). In this diagnostic technique the optical emission of beam-excited residual or background gases is used as a diagnostic of beam

intensity and transversal profile. Full details can be found on the DITANET website:

www.liv.ac.uk/ditanet



Forthcoming Events

Second DITANET Topical Workshop Longitudinal Beam Profile Measurements in High Energy Accelerators 12th/13th July 2010

The exact determination of the time structure of ever shorter bunches in accelerators and light sources like the X-FEL, the ILC or CLIC is of high importance for the successful operation of these next-generation machines. It is also a key to the optimization of existing scientific infrastructures. The exact measurement of the time structure poses a number of challenges to the beam diagnostics system: The monitors should be non-destructive, easy to maintain and provide time

resolutions down to the femtosecond regime!

Within DITANET CERN, DESY, GSI, LBNL, PSI, Royal Holloway, STFC, U Dundee and U Liverpool are active in this research area. These partners have led many of the developments during the last decade and are helping to pave the way for future facilities.

This two day workshop will bring together experts from the beam diagnostics community to provide a forum for knowledge exchange, a

review of the state of the art, and discuss future developments and challenges.

Topics will include: RF deflecting structures for bunch length monitoring; Beam profile monitoring using Electro-Optics techniques; Exploitation of diffraction and synchrotron radiation for non-invasive diagnostics; Bunch shape monitoring in hadron accelerators.

All contributions will be made available via the CERN Indico server and will be linked from the Network's web site.



New to the Network

Febin Kurian



Febin, after finishing the Bachelors in Physics from Mahatma Gandhi College, Iritty, India in 2002 with an interest in the modern physics, moved to CUSAT (Cochin University of Science and Technology), Kochi, India to undertake a Masters in Physics. The Masters course was specialized in modern optics, thin film physics and solid

state physics with a strong support of quantum mechanics and nuclear physics.

After graduation, Febin worked for over a year in Sungkyunkwan University, South Korea on the topic of 'fabrication and the low temperature transport measurement of single and double quantum well HEMT structures' at

Sungkyunkwan Advanced Institute of Nanotechnology.

Febin entered the DITANET network in March 2010 and chose to join GSI to work on the topic of 'Diagnostic method for low ion current at the FAIR storage rings and transfer-lines'.

Cherry-May Mateo



Cherry-May was awarded her Bachelor of Science in Physics by the University of the Philippines, Diliman, Quezon City and was an active member of the semiconductor research group under the Condensed Matter Physics Laboratory. Having been assigned in optical characterization of GaAs based semiconductors; her bachelor thesis topic was on optical characterization of strained GaAs heterostructures. This study led to her first international

publication in a peer reviewed journal.

Following graduation, Cherry-May proceeded with her master's degree and continued carrying out research in the same laboratory. Her affiliation and active participation in this laboratory continued as she became a graduate student and a part time junior faculty of this same institute. She finished her master's degree within two years and was able to co-author three further peer

reviewed scientific papers.

Knowledge of the wide range of fields that particle accelerator physics covers urged Cherry-May to explore this research further. For her, there are many areas to explore in this field which provides young scientists with the opportunity to be creative and learn how to become good research scientists. Cherry-May became a DITANET trainee in October 2009, based at CEA, France.

News from DITANET Partners

CERN, Switzerland (*Maja Olvegård*)

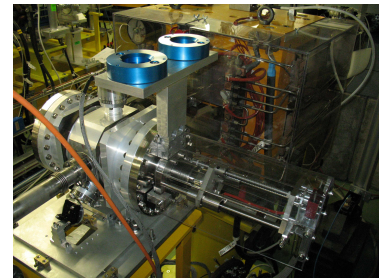
A new system for transverse profile and emittance measurements has been installed in the Test Beam Line (TBL) at the CLIC Test Facility (CTF3) at CERN. The system consists of a tank containing two different screens and a replacement chamber. The screens can be inserted in the beam pipe and Optical Transition Radiation (OTR) will be emitted when the beam passes through it. The OTR will be imaged by a

CCD camera and from this image the beam profile can be reconstructed.

TBL is a new beam line at CTF3 and serves as a small-scale version of the CLIC decelerator. In TBL all the critical issues regarding the behaviour of the decelerated beam, should be thoroughly investigated. Those are e.g. emittance blow-up and following beam losses, stable RF production, changes in energy and

energy spread due to the deceleration, a.s.o.

The commissioning of the beam line will start in late spring 2010, and with the new emittance tank in place, and the already installed spectrometers, most of the diagnostics elements that are needed for a successful study are at disposal.



The vacuum tank, containing the screens, installed in the beam line.

University of Maryland, USA (*R. Fiorito, H. Zhang, S. Artikova*)

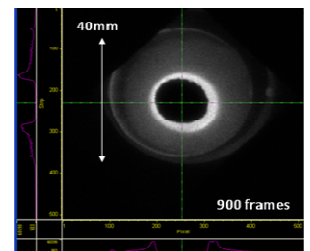
A thorough understanding of halo formation and its possible control is highly desirable for essentially all particle accelerators. Particles outside the beam core are not only lost for further experiments, they are also likely to hit the beam pipe, and activate this, as well as accelerator and experimental components in close proximity, which makes work on the accelerator costly and time consuming. Well established techniques for transverse beam profile measurements of electron or high energy hadron beams are the observation of synchrotron or optical transition radiation.

A particular challenge, however, is the detection of particles in the tail regions of the beam distribution in close proximity of the very intense beam core.

Based on earlier investigations into high dynamics range beam profile measurements at CERN, the MPIK and Liverpool, that characterized the dynamics range available from novel camera technologies, such as Thermo Fisher's SpectraCam XDR, as well as from a micro mirror-based observation technique supported by ViALUX, measurements were recently realized at the University

of Maryland Electron Ring (UMER). In this experiment, a flexible core masking technique based on a DMD micro mirror array, which allows for a fast mask generation to blank out the central core and to focus the measurement on the tails of the distribution, was used to investigate into resulting dynamic range.

In first tests, beam profiles were already measured with a DR in excess of 10^4 . Further measurements are planned and shall contribute to an improved understanding of the physics of charged particle beams.



Beam profile with deflected core at UMER.



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Examples of Recent Publications/Presentations

Publication resulting from collaboration between CERN, MPIK, Thermo Fisher, VIALUX and U Liverpool:

J. Egberts, et al., "Flexible core masking technique for beam halo measurements with high dynamic range ", JINST 5 P04010 (2010).

Publication resulting from collaboration between GSI, MPIK and U Liverpool:

A. Papash, et al., "Realization of Nanosecond Antiproton Pulses in the Ultra-low Energy Storage Ring", Nucl. Instr. Meth. A, [dx.doi.org/10.1016/j.nima.2010.03.153](https://doi.org/10.1016/j.nima.2010.03.153)

Events 2010

DITANET Events	
July 12 th and 13 th	2 nd Topical Workshop: Longitudinal Beam Profile Measurements in High Energy Accelerators, The Cockcroft Institute, UK
October 15th	DITANET Steering Committee Meeting, CERN
Other Interesting Events	
May 2 nd – 6 th	Beam Instrumentation Workshop, Santa Fe, USA
May 24 th – 28 th	International Particle Accelerator Conference, Kyoto, Japan
July 2 nd -7 th	ESOF, Torino, Italy
August 23 rd – 27 th	FEL, Lund-Malmö, Sweden
September 12 th -17 th	LINAC, Tsukuba, Japan
September 12 th -17 th	ECAART, Athens, Greece

NOTICE BOARD

DITANET: FINAL CONFERENCE

This event will take place in Seville, Spain during November 2011.

DEADLINE FOR THE NEXT NEWSLETTER

28th June 2010.

About DITANET

The development of novel Diagnostic Techniques for future particle Accelerators is the goal of the European Network (DITANET) which is installed within the Marie Curie ITN scheme. Several major research centers, leading universities, and partners from industry are developing beyond-state-of-the-art diagnostic techniques for future accelerator facilities, whilst jointly training students and young researchers within this unique European structure.

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