

## Marie Curie Project : meeting #3 (01/10/2012)

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Slides: <http://indico.cern.ch/conferenceDisplay.py?confId=210904>

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### **Latest news:**

Nuria and Helene have attended the workshop/clinic for proposal writers:

<https://indico.cern.ch/conferenceDisplay.py?confId=210726>

Some important (unformal) tips learnt:

- In the proposal, each PhD student must have at least a secondment of 3 months in industry
- The proposal should include 10 PhD students, so we need to find at least 3 subjects of PhD.
  - One first additional subject could deal with the development of rotating coil for the same type of fiducialisation measurements. Michele will discuss that subject with Stephan Russenchuk
  - A second subject could concern power supply, as very low noise will be needed during the measurements. Nuria will contact Serge Pittet (or David Nisbet).
- The preparation and writing of the proposal will represent a huge load of work, and Nuria will be responsible of that part.

### **Review of PhD projects & round table discussion:**

Stabilization (Andrea): the proposal of PhD subject concerns the development of a displacement, stabilization and monitoring system for the main linac quadrupole test stand, including tests of compatibility with the pre-alignment system, the use of stabilization system for displacement of controlled quadrupole movement instead of a simple mover, and the control of displacement with seismic sensors. This would be the task of 1 PhD student. One potential partner on the industrial side is CETIM (Centre Technique des Industries Mécaniques) and on the university side: SYMME (laboratoire SYstèmes et Matériaux pour la MEcatronique).

Magnetic measurements and global integration (Michele): two proposals of PhD subjects are introduced. The first one concerns the development of a Magnetic Measurement (MM) system that can be integrated in a serial production activity towards series production of particle accelerator modular structures. The tasks foreseen are:

- The optimization of the proposed MM method and system based on existing CERN stretched/vibrating wire technology
- The development, test and implementation for both types of quadrupoles

- Investigation and development of the hardware and software for a potential utilization in series production

An industrial partner remains to be found, but training partners could be PSI and ESRF.

The second subject is based on quadrupole magnets and main components *high precision* assembly and global integration, including the definition and selection of the most appropriate series assembly procedure for quadrupoles, vacuum chamber, BPM and their relative supports, their development and implementation for both types of quadrupoles (DB and MB). The design / procurement of a displacement system for DB quadrupole would also be part of this subject.

CETIM could be an interesting industrial partner, while Cranfield and Bremen universities could be training partners.

Beam Instrumentation (Manfred): the studies on the BPM should cover all critical aspects on measurement and alignment of the BPM detectors and their read out electronics, including firstly in a preparation phase: the analysis of the BPM with stretched wire signal stimulus, the analysis of the stretched wire, the integration of the cavity PBM detector, secondly the measurements and the data analysis. The ultimate achievable resolution on the wire position measurement, expected to be 1nm or less would be studied as well. The training of 3 months in industry is foreseen at National Instruments. Visits of collaborating laboratories (KEK and DESY), as well as participation to workshops and conferences (CAS, IBIC) are also proposed.

Metrology (Ahmed): the subject would concern mainly the optical measurements performed by the CMM Leitz Infinity with respect to the stretched wire, including the development of a biaxial sensors, adapted supports and tooling, with associated calibration methods. The compatibility of measurements in magnetic fields would also be checked. The key partner of the subject is Leitz, which will be contacted soon by Ahmed. A university should be found concerning the supervision of the PhD student.

Alignment (Hélène): the objective of the studies is to test and provide different solutions of absolute measurements for the fiducialisation of CLIC quadrupoles: Frequency Scanning Interferometry (FSI), Micro triangulation, Wire Positioning System (WPS). This implies to have a good knowledge of these methods and perform the developments needed to improve their precision and accuracy, prepare their implementation, perform the measurements and analysis. Inter-comparison between methods would be performed as well. A meeting will take place on the 2th of October with Etalon AG (FSI systems), and ETHZ will be contacted for training, secondment and supervision of the PhD student.

#### **A.O.B:**

- There is a strong support by the CLIC project
- Steinar recommends not to focus the proposal on the CLIC only.

#### **Next steps (all):**

- Get the approval of the hierarchy: e.g. a green light from all group leaders concerned.
- Contact ASAP industries and universities that could be part of this project.

