Minutes of PLUME Phone meeting
- 2010, June 18 -

J.Baudot

Participants

- **University of Bristol**: Joel Goldstein,
- **Desy, Hamburg**: Ingrid Gregor, on the phone: Lena Bachynska, Ulrich Koetz
- **University of Oxford**: Andrei Nomerotski,
- **IPHC, Strasbourg**: Jrme Baudot, Nathalie Chon-Sen, Gilles Claus, Mathieu Goffe, on the phone: Marc Winter.

Agenda

During this one day meeting, we reviewed all aspects of the project and defined the next milestones, agenda and slides at http://indico.cern.ch/conferenceDisplay.py?confId= 95676.
A short introduction by jerome reminded that we are currently creating the 2010 full-scale prototype. It is a long process since we need to understand each difficulty and trap for future prototypes. Also, the main goal for 2010 is to obtain a functional double-sided ladder (12 sensors) and not to have it in beam as soon as possible even though we will eventually test the prototype in beam. A first sensor has already been put in operation on a PCB version of the flex. We have all the parts to move forward but will move slowly to learn as much as possible.

1 Mechanical design and assembly, Joel

Joel showed the final designs of the ladder and the box to support it. Two comments were issued: use some kapton tape to isolate the flex metal traces from the aluminium end plate and add an extra clamping system to maintain the small mollex connector at the flex-end.
The foam has been ordered and is expected back at Bristol around end of July. Its surface will be re-worked in lab to insure a correct flatness whilst the provider failed to guarantee the requested flatness of around 50 μm.
The first supporting box is expected to come out of Bristol workshop sometimes in August. Joel will also prepare a part to interconnect the box with the air pipe in which air is simply blown by a fan.

The plan to assemble the module were also described. It uses a single plate with alignment pins on which the modules will be transfered directly from their shipping sole. A number of dimensions is still missing to finalise the precision fixtures (to be provided by IPHC). A first assembly test will be realized with modules equipped with MIMOSA 20 sensors bonded on the flex.
Joel agreed that Bristol will realise a survey of the ladder positions/dimensions of prototypes. The measurements to investigate the stability of the ladder in operation (power-pulsing and air flow) requires further planning for manpower and time.

2 Temperature measurements, Mathieu

Mathieu presented a movie of the temperature evolution when MIMOSA 26 is switched on. The images were obtained with an IR camera. They provide an example of what is achievable with such an instrument and demonstrate that, when placed in open air, the chip reaches about 52 degrees when fully operated (low threshold).
These measurements will be repeated with the full ladder in the box provided an IR window can be set on the ladder box (material to be found).

An engineer in DESY, Franziska Hegner, is available in July to simulate this exact configuration and try to reproduce the measurements.

3 Module prototype testing, Nathalie

Nathalie reported the success of the connection to the PXI acquisition system of the first sensor bonded on the PCB-flex version (module GPF1). Some issues appeared but no show-stoppers. So the detailed characterisations is going on...
If everything goes well, a first kapton-flex equipped with 6 MIMOSA 26 may be assembled and bonded in August. Since these minutes are late, we can add that the 3 sensors on the PCB-flex version (GPF1) are now (July 8) bonded and provide signals to the acquisition system. Further detailed investigation to detect potential interference between them are on-going.

4 Flex design, test and ordering, Andrei

The flex low-quality obtained with Graphics and their lack of responsiveness drive us to give up this vendor. Since no design error have been found so far on the flex, Oxford do order kapton flexes to OptiPrint now. They will be thoroughly tested by Andrei and Pete when received (expectation is early July).
The procedure to mount passive components have been improved in Oxford and will be used unless quality issue appears again (as was detected on the very first PCB-flex samples).

The drawing of a mirror design of the current flex has almost been completed by Pete. It is not yet clear how we will proceed for the ordering of the next designs which, on top of the mirroring, may include thinner metal traces and traces going under the sensors. We only stated that we will go step by step with decreasing thicknesses of metal (10 then 5 μm). This strategy will be re-evaluated after the results of the first operational module.

5 Power pulsing tests, Ingrid, Lena and Uli

The test-bench to study power pulsing for the analog part of MIMOSA 26 has been installed in DESY and is operational. preliminary results were reported with some data analysis (thanks to Jolanta) for pedestals and noises.

It was mentioned that to evaluate the digital part of MIMOSA 26 under power pulsing, a laser spot focused on the sensor is probably the only way. Such a system exists in DESY (to be re-activated?)

6 AID box design, Andrei

Andrei displayed the Alignement Investigation Device (AID box) concept as drawn by Stephanie in Oxford. The distance between stations should be arranged according to typical ILD and SiD setup where 3 to 5 layers are spaced over a 45 mm distance. A rotational degree of freedom is still to be accommodated for station #2. Finite Element Analysis will help decide which orientation (vertical or horizontal) can be afforded for the ladder which will be single-ended supported. It was decided to buy a set of two stages to IP for evaluation (also including controlling software) in Oxford.

7 Planning, action items, next meetings

The PLUME planning is somehow slipping to allow for the extended investigation on the PCB-flex prototype:

- July: ordering flex to OptiPrint;
- July-August: ongoing test/validation of the module with the PCB-flex equipped with 3 sensors;
- August: fabrication of the ladder box and of the tools for the assembly of ladder in Bristol;
- September: start to produce ladders with the “best” available flex.

Our next phone meeting should happen end of August or beginning of September when significant progress will heav been made.