

Minutes of the Linac4 Diagnostics Working Group Meeting held on 19 May 2008

Present: C.Dutriat, E.Sargsyan, U.Raich, J.Tan, F.Lenardon, G.Tranquille, E.Bravin, B.Holzer, M.Pasini, A.Lokhovitskiy, R.Scrivens, K.Hanke, B.Mikulec.

Agenda:

1. Communications
2. Follow-up of open actions
3. FLUKA simulations for Linac4 - what are the options?
4. Status of the diagnostics (hardware/software) for source and LEBT
5. AOB

2. Follow-up of open actions

- *Emittance meter slit:* U.Raich will investigate the status.
- *Mandate:* This action was closed and has to be replaced by an action to provide a work package description with spending profile. A template should be used (can be obtained from S.Ramberger). Once the figures have been filled into this template, it should be sent around to the concerned people for approval before being forwarded to M.Vretenar.

Assigned to	Start date	Description	State	Result
U.Raich	2008-05-26	Produce a work package description of the project. Once approved by the concerned people, communicate to M.Vretenar together with the EVM document and a spending profile.		closed 18/12/08, not completed at this date; BI responsibility and no longer edit followed up by this working group

3. FLUKA simulations for Linac4 - what are the options?

B.Holzer informed us of the outcome of her discussions with V.Vlachoudis. V.Vlachoudis confirmed that the Linac4 FLUKA simulation task will be attributed to his section. He estimates that it would take about 2 months for an experienced person to provide the FLUKA simulations; manpower should be available beginning of 2009. This fits well with the Linac4 schedule as the final design of Linac4 should be available by then. It was noted that the team should start first with simulations of the DTL region. Care has to be taken to use the most up-to-date drawings as there have been many changes since the first version of the FLUKA geometry description of 2003.

The simulations should confirm the suitability of a BLM in front and after the DTL because it is not clear if the threshold of the BLM is too high to detect the losses. Otherwise the transformers could be used or maybe also a neutron detector. Neutron detectors seem to be readily available 'off the shelf' and V.Vlachoudis could give advice on this subject. There will obviously be losses in the chopper line, but it is not yet clear if machine protection will require a loss detection system. For the moment a BLM will be placed tentatively at the DTL entrance.

4. Status of the diagnostics (hardware/software) for source and LEBT

R.Scrivens summarised the status of the LEBT diagnostics.

- **Faraday Cup Retractable:**

Hardware:

Installed.

Electronics:

For the HT suppression a power supply and cabling is required. E.Bravin agreed to provide a -1 kV power supply and cabling.

For the readout an oscilloscope will be used; ABP can buy a scope plus cable and resistances for this summer. R.Scrivens mentioned that for the end of 2009 digital readout should be made available; for this purpose a buffer amplifier and OASIS is needed. After the meeting CO stated that it is not foreseen to provide OASIS for the 3 MeV test stand. BI suggested to use an ADC; the sampling rate should be at least 1 MHz. The DSC for the FC has been ordered, but the status of the order should be verified.

For the manipulation of the FC compressed air is required. The piping to the LEBT is already done, but not the final installation (pressure reducers etc.). A local position controller is also needed. C.Bal should be contacted to prepare the compressed air. The control is foreseen with a BI PLC system.

Software:

Front end IN/OUT control required. No specific application.

- **Faraday Cup Test:**

As above, except that the hardware design (mounting) is not yet finalized. ABP can pull one more readout cable.

- **Transformer:**

Hardware:

F.Lenardon explained the status: the design should be finished by the end of July and approved in September. The transformer should be available end of January 2009. The is well advanced with respect to the requirement for installation ready for beam to the RFQ.

Electronics:

The analog electronics (calibration, head amplifier, signal restitution) are ready.

Readout electronics will be provided through front end ADCs and VME. Some modules have to be ordered, but everything should be available by the end of the year. Cabling is already integrated on the cabling list.

Software:

Based on front end sampling and integration. No specific application is needed; the front end software will be based on the Linac2 BCT system.

- **Energy Spread SEMGrid + Beam Profile SEMGrid:**

Hardware:

Design work is underway (C.Vuitton). These are the **same** SEMGrids moved between two locations.

Electronics:

Amplifiers and digitizers will be provided by C.Dutriat (the amplifiers are available). The acquisition will be performed with the new BI card, but this needs a FESA class to be written (A.Guerrero). Compatibility of this should be verified with CO and OP (J-F.Comblin). The FESA class is required before end September; the SEMGrid applications also needs to be reconfigured.

As for the FC, compressed air is required for the manipulation. Also there, no final installation is yet provided. Again, a local position controller is needed. It might be possible to add the IN/OUT control to the PLC of the chopper.

The SEMGrid system needs a ~+300 V power supply and cabling for HT suppression. BI agreed to order the power supply.

Software:

As mentioned, a FESA class is required. K.Hanke said that the generic application from J-F.Comblin can be used, but will need some modifications during the next shutdown. This fits with the timescale to use the SEMGrid with the spectrometer early in 2009.

• **Spectrometer Magnet:**

ABP will take care of the magnet and the input slit. The slit is a manual system and the magnet already exists.

• **Emittance Scanner:**

Hardware:

The design has been approved and the hardware is being produced.

Electronics:

HT suppression is needed there as well for the slit (separate voltage), the SEMGrid (same voltage as other SEMGrids) and the FC at the end of the line (same voltage as other FC) --> 3 voltages. BI will foresee the power supply and the cabling.

E.Bravin said that a PLC based system will be used for the stepping motor for the slit based on a standard CO FESA class. A new linear position potentiometer will be used for the position encoder readout, requiring a new PLC based system. Cabling required.

SEMGrid amplifiers and digitizers: same situation as with the other SEMGrids (see above).

Software:

Front end software and a new application are required. K.Hanke volunteered to recontact CO on this issue. X.Serrano is the Linac4 controls linkman. The emittance meter application is the most urgently needed application. E.Bravin expressed the opinion that the application should not calculate the emittance - this should be done 'offline' by the beam physicists; the application should simply automate the data gathering. R.Scrivens on his side said that the application should calculate the emittance, but perhaps only with basic data treatment.

After this meeting, K.Hanke contacted CO. E.Hatziangeli agreed that the emittance scanner application will be provided by CO using the RADE environment in LabView on top of standard CO interfaces. K.Hanke will prepare precise user requirements and a collaborator from India such that the application will be available in the second half of 2008.

Assigned to	Start date	Description	State	Result
E.Bravin	2008-05-29	Provide a -1 kV power supply and cabling for the FC and a +300 V power supply and cabling for the SEMGrids. Cabling plus a separate power supply is needed for the slit of the emittance scanner. Identify a suitable ADC for the FC readout.		Power supplies OK; the CERN ADC will be used; C.Dutriat will follow up the cabling. edit
R.Scrivens	2008-05-29	Contact C.Bal to finalise the compressed air installation for the LEBT Faraday Cup and SEMGrids.		C.Bal has been contacted and will follow up the issue. edit
U.Raich	2008-05-29	Control if cabling (signal plus HT) has been foreseen for slits of emittance scanner. Otherwise add to the cable planning.		U.Raich has sorted this out with C.Rossi. edit
K.Hanke	2008-05-29			edit

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Provide to CO user specifications and timescale for the development of the emittance scanner application. Identify an Indian collaborator who can help develop the application.

See minutes
09/06/2008 and
23/06/2008.

-- BettinaMikulec - 26 May 2008

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Topic revision: r11 - 2008-12-18 - KlausHanke



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