

Minutes of the Linac4 Diagnostics Working Group Meeting held on 17 December 2007

Present: E.Bravin, C.Dutriat, B.Goddard, K.Hanke, T.Lefevre, M.Ludwig, M.Pasini, U.Raich, L.Soby, C.Vuitton, W.Weterings.

Agenda:

1. Communications
2. Follow-up of open actions
3. Diagnostics requirements for H- injection into the PSB
4. AOB

1. Communications

R.Scrivens needs to know the tolerances for the precision of the slit of the emittance meter. For the 45keV case it is proposed that the slit thickness should be constrained to 0.2mm (+0.00 -0.05mm) at the chamber edge and the final tolerances on the slit can be 0.09 +/- 0.02mm. This needs to be confirmed, and the tolerances for the 3MeV and 12MeV cases be determined. T.Lefevre agreed to follow up the matter with D.Gerard.

Assigned to	Start date	Description	State	Result
T.Lefevre	2007-12-17	Determine slit tolerances for emittance meter at 3MeV and 12MeV		2007 edit

E.Bravin noted that the slit can be manufactured with a certain precision, but once it has been manufactured the real dimensions can be measured with a much better precision.

K.Hanke has brought up the matter of the IPHI diagnostics line at the linac4 core meeting. It was confirmed that the IPHI diagnostics line will be available for the 3 MeV test stand at CERN.

M.Hori has given a presentation on the Beam Shape & Halo Monitor on 13 December. From AB/BI T.Lefevre was present. In the discussion it was suggested to make the BSHM part of the movable diagnostics bench and to use it at higher energy for commissioning of the DTL tanks. The slides of the presentation are available at

<https://twiki.cern.ch/twiki/pub/SPL/DiagnosticsWorkingGroupMeetings/BPM2007.pdf>

In the next meeting of the Booster Commissioning Working Group (<https://twiki.cern.ch/twiki/bin/view/SPL/BoosterCommissioningWorkingGroupMeetings>) the diagnostics needed for the latest design of the transfer line will be discussed. This matter will subsequently be discussed in one of the next meetings of the Diagnostics Working Group.

2. Follow-up of open actions

Action for C.Vuitton and Y.Cuvet to produce working drawings for the inter-tank/inter-module regions of the linac. A first version of a drawing for the CCDTL is ready (SPLACDTL0058(03-12-07).pdf). Y.Cuvet has implemented all beam monitors, the combined quadrupole/steerer magnets (best guess) as well as bellows and flanges. The drawings for the DTL and PIMS will be ready soon. Everybody should verify whether all the diagnostics is in the right place and whether the dimensions and the space allocated is OK. A meeting will be organised with Y.Cuvet and A.Lombardi as soon as the drawings for DTL and PIMS are ready.

Action for U.Raich to develop a controls strategy for the diagnostics. The CERN ADC cards are being produced and are expected for this week. They will be tested in the first 2 weeks of January. M.Ludwig asked

whether the transformers will be read out via OASIS. This is sufficient for the 3MeV test place. For Llinac 4, an application (existing for Linac2 and 3) will be needed. The details can be found in the minutes of 3 December (<https://twiki.cern.ch/twiki/bin/view/SPL/Minutes03December2007>).

Action for U.Raich to start with a design of a movable diagnostics bench ("D-plate"). U.Raich has started literature studies. K.Hanke suggested that the BSHM could be made part of the movable bench. In a first iteration, all the diagnostics to be installed on the bench needs to be specified. Then a detailed lay-out and simulations are needed.

Action for G.Tranquille to do simulations for the emittance meter at 3MeV and 12MeV in order to make a choice for the slit material and slit cooling. G.Tranquille not present, it is assumed that studies are ongoing.

Action for U.Raich to follow up the VME crates needed for the 3MeV test place. U.Raich has discussed the matter with J.Serrano.

3. Diagnostics requirements for H- injection into the PSB

W.Weterings presented the lay-out of the Booster injection period (17-12-2007-diagnostics.pdf). There are two possible locations for diagnostics (154 and 261mm). Diagnostics is needed to center the beam on the foil and to monitor the beam size. Diagnostics is also needed to monitor the stripping efficiency and to diagnose e.g. if a foil is damaged or broken. For the position/profile measurement screens were proposed which can be used to determine quantitatively the beam size. They have to be retractable. The cameras need to be protected or radiation hard. Time resolution is not required. A foil is also needed for the incoming beam.

A set of two SEM monitors (foils) was suggested in front of the dump in order to measure the H0 and H- and thereby the stripping efficiency. The dynamic range appears to be no problem (1E8 - 1E13). This monitor would be in the beam all the time and monitor the stripping efficiency during operation. An SEM foil would fit into the space available. Alternatively, a segmented dump would do the job and appears to be the more robust solution. This was retained as baseline, but is pending the design of the dump.

The issue of BLMs was discussed. BLMs will be needed in the area in order to localise beam loss. The question was raised whether this spatial resolution can be accomplished, i.e. whether the location of beam loss can be identified by a set of BLMs at different locations in the Booster injection period. It is required to identify beam loss caused by the septum, the foil and the dump. B.Goddard will write down a first order draft specification.

Assigned to	Start date	Description	State	Result
B.Goddard	2007-12-17	Provide specs for BLMs in the PSB injection period		2007 edit

4. AOB Next meeting January 2008. An invitation will be sent out in due time.

-- KlausHanke - 17 Dec 2007

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