

FETS Meeting RAL CR6 R2 – 05th June 2013

Present: J. Pozimski, A. Letchford, P. Savage, M. Dudman, D. Faircloth, S. Lawrie, S. Alsari, S. Gibson, J. Back, G. Boorman, C. Gabor
M. Aslaninejad, M. Clarke-Gayther, C. Plostinar

Apologies: R. D'Arcy, S. Jolly, A. Bosco, S. Boogert, A. Kurup, P. Posocco,

Circulation: All

Next meeting date: 03rd July 2013 at RAL

Administration

1. Spending is less than anticipated during the first two months of 2013. Everybody should consider their future spending and highlight it at the next meeting.
2. The calendar and web page are up and running and looks good.
3. IPAC – Interesting posters but weak on presentations. America was not well represented.

RFQ (P. Savage)

1. Parts need to be modified / made at Imperial to aid alignment of RFQ at NAB. The workshop at Imperial is busy which has impacted on schedule therefore options may include using external contractor or RAL workshops.
2. The inspection procedure was discussed and whether or not the RFQ should be taken to RAL for a second inspection. It was thought that this should be done on the first section and then reassessed for the other three sections.

Ion Source / LEBT (D. Faircloth)

1. Alignment has been looked at and it was found that a misalignment of 1mm can be produced when tightening the bolts. A rotation re-alignment of 180 degrees did not produce an error.
2. Some bolts have been found to be magnetic and will be replaced, even though at 200mm from beam axis should not be causing an effect.
3. 25Kv power supply working, running at 50MHz at 2ms extraction. 23Kv have been achieved and with adjustment may provide 30Kv.

Ion Source / LEBT (J. Back)

1. Alignment studies have shown that there is a disagreement between actual and experimental results.
2. A small tilt in the solenoids produce results close to actual. The solenoids are only aligned on the bore, not the magnetic field.
3. If it is assumed that the beam is on zero, adjustment or repositioning of solenoid may provide a solution. However this is with one solenoid and therefore results will vary when all three solenoids are turned on.

RF (S. Alsari)

1. 60W tests are now complete producing results to match or improve on circulator specifications.
2. It is now confident that circulator will now operate correctly dumping RF to dummy load and not the Klystron.
3. Thought should be given to an interlock system for the power and water.

Laser (S. Gibson)

1. The fibre has now been delivered
2. A summer student will be available for six weeks.
3. Drawings are complete for the light box and manufacturing will now commence.
4. A document is to be drafted for the MOU with CERN.
5. There is no requirement for large spending on lasers in 2013.

Laser (C. Gabor)

1. The advantages of using a scintillator was discussed and the need to cater for all beam envelopes.
2. Existing laser diagnostics design is based on C. Plostinar's MEBT design and is adjustable and expandable. It can incorporate a doublet or a triplet.
3. Further tests with variable beam will be conducted to ensure laser is used to its full potential. Diagnostics should not define beam size.
4. The introductions of mobile scintillators must be considered due to the fact that the electronics made not be radiation hard.

Particle Distribution (J. Pozimski)

1. Simulations are based on three bunching cavities. It is split into two parts, dealing with beam chopping and laser diagnostics.
2. The beam is well contained but will de-bunch, therefore the distance between quadrupole and dipole can be reduced.
3. The vessel parameters that J. Pozimski used in his simulations need to be defined.
4. Analysing the edge and fringe focusing will input into the dipole design.
5. C. Gabor, P. Savage, S. Gibson and J. Pozimski to meet at RAL around the 12th June 2013 to discuss results and possible next steps.

RFQ Injection (J. Pozimski on behalf of S. Jolly)

1. A general discussion took place regarding the results of S. Jolly's talk at the last meeting. Questions were raised as to the way the results were generated.
2. S. Jolly's conclusion was not consistent with the expected results.
3. A further discussion should be had when S. Jolly and R. D'Arcy are present.

Shielding / Infrastructure (P. Savage / M. Dudman)

1. P. Savage started a discussion in which everybody was asked to consider their cabling requirements for equipment inside the bunker.

2. It will have to be considered if the trench is large enough to hold all cables and whether cable trays will have to be used. Will certain cables need to be shielded from others to prevent interference?
3. There was a request to have electronic racks inside the shielding and whether or not there is enough space.
4. D. Faircloth brought up the fact that shielding was required over the ion source cage. Ideas ranged from concrete blocks, lead and steel. A. Letchford had an idea to create a canopy on the side of the ion source rather than over the roof, as this could mean higher temperatures inside the cage and problems in supporting such a structure.

Beam Diagnostic

Toroid (S. Lawrie / P. Savage)

1. Two toroids made with two amplifiers available. Three more are required.
2. Tests have confirmed that there is a good time response.
3. An apprentice may be available to make the remaining toroids.

BPM

1. It was discussed if the CERN design was the best choice as only the software and not the hardware will be re-usable.
2. A final decision on the lattice design should be made. It is unlikely that it will be changed but may be added to.
3. Is the MEBT designed to do the task with a view to reusing BPM's? At £3000 per unit financial losses could be £15000 which could be acceptable. Cavities however are expensive and would need to be reused.

DAQ (G. Boorman)

1. A presentation will be given at the next meeting.
2. Everyone was asked to think of what they want measuring and possible cable lengths.

MEBT

Design (M. Aslaninejad)

1. The latest field maps provided by S. Lawrie are being used in the simulations.
2. Transportation is good but chopping is not satisfactory.

Design (C. Plostinar)

1. C. Plostinar gave a presentation showing four different MEBT designs including SNS, J-PARC, LINAC 4 and ESS.
2. There are two requirements, chopping and optics
3. It needs to be defined how the MEBT design will be selected and how it is going to be built. An example of this is the lattice design. A criteria should be agreed and committed to which can then be followed through to manufacture. This process should be an informed decision.

4. A comparison of the four designs should be made and compared to give FETS realistic options and targets. C. Plostinar to make comparison and discuss in a separate meeting before the next FETS meeting.
5. The comparison of the MEBT's and the defined design will enable further discussion / decisions to be taken on chopper, dump, cavity and magnet design.

Chopper / Dump – No update

Cavities – No update

Magnets – No update

Integration – No update

AOB

A question was raised as to whether there was a link on the wiki page to uploaded files. The special pages area contains these links.

Actions:

1. P. Savage to look at RAL or outside manufacturing options.
2. S. Gibson to look at drafting MOU with CERN.
3. C. Gabor, P. Savage, S. Gibson and J. Pozimski to meet to discuss particle distribution.
4. Everyone should look at their requirements for cabling inside the shielding and inform P. Savage.
5. C. Plostinar to make comparison of MEBT design and present conclusions at the next meeting.