FETS Meeting RAL R3 CR11 – 17th April 2013

Present: J. Pozimski, A. Letchford, P. Savage, M. Dudman, D. Faircloth, S. Lawrie, M. Clarke-Gayther, S. Alsari, C. Gabor, S. Gibson, R. D'Arcy, S. Jolly, J. Back, G. Boorman, A. Bosco

Apologies: S. Boogert, A. Kurup, P. Posocco, C. Plostinar, M. Aslaninejad,

Circulation: All

Next meeting date: 8th May 2013 at UCL

Administration

1. Spending plan to be completed for year 2013 / 2014. Everyone is to look at their own spend and produce a work plan.
2. PASI meeting held and well represented
3. FETS website being developed to enable outside users to reference site.
4. It was noted that it would be useful to create a central list of contacts in FETS Gmail account making it easier to send group emails.
5. There may be a possible collaboration for slow beam dump, chopper and RFQ designs.
6. ESS had originally requested time for scintillator tests. This will now be done in Stockholm.
7. FETS to be used for possible future radiation and target studies.

Shielding / Infrastructure

1. The store room and plant room partitions will be installed on the 24th of April 2013
2. A. Letchford informed the group that the downstairs kitchen area in R8 has been secured for use by FETS for meeting etc.
3. The shielding design will commence with NELCO once internal height has been calculated. M. Dudman will visit imperial to meet with S. Alsari and P. Savage to determine RF component layout and dimensions.

RFQ

1. Section one complete and being assembled prior to inspection.
2. An unplanned ‘indent’, 2mm deep and 4mm wide, from a bullnose cutter in the low field region has occurred during machining. This led to a discussion of possible side effects and remedies including replication of ‘indent’ or adjustment with copper fingers. Tests will reveal the extent of the problem if any.
3. Arrival date at RAL inspection estimated as week commencing 13th May 2013.
4. A. Letchford presented a coupler design based on an ISIS one with a reduction in length and volume. A prototype will be made and tested.

RF

1. Circulator performance tests now complete using new antenna, designed and manufactured at Imperial. Results were better than manufacturer's data and prove circulator works at low power.
2. The transition from waveguide to coax works well.
3. A question was raised regarding the specification of the tee piece and the ohm's delivered to each leg. The manufacturer will be consulted.
4. It was also suggested that the tests be repeated at 60W.
5. There is only requirement for diagnostics on klystron side of circulator.
6. It was expressed that the klystron should incur the smallest move necessary to accommodate the circulator within the tight space. It may be possible to modify the dummy load / cage in order to save space.
7. M. Dudman was asked to give an update presentation at the next FETS meeting.

Ion Source

1. Ion source has been run at 65KV.
2. The filing cabinets have been placed against the side of the cage to act as shielding.
3. One insulator has been failing and an old insulator has been used as a spare. It was suggested to design another due to a lead time of two months to order a new one in case of failure. This would not however be a straight forward copy of the old one and the design would have to be changed. Alignment issues incurred by change of insulator design would need to be addressed. Risk of failure of component compared to cost of spares should be looked at.
4. Mis-alignment in the column needs to be addressed allowing it to be fixed into placed ensuring repeatability during removal / replacement.
5. 25 KV extraction supply to be fitted by next week. It is not yet possible to run at 50Htz.

Toroid

1. Torroid's to be vacuum tested to verify design

DAQ -

1. Updated costs: 6 BPM's connectorised FE 20.5K, 6 BPM's Linac 4 FE 15.2K estimated with 5 to 10% error.

BPM

1. MEBT design with 3 re-bunchers to be used.
2. BPM width 108mm with total space available 180mm.
3. Space allows for up to 7 BPM's.
4. BPM's will be attached to vessel / cavity to inherit alignment.
5. If 4 re-buncher design is used BPM position will be compromised.
6. A meeting is taking place on the 18th April 2013 where details will be confirmed.

Laser

1. The keys have been returned from repairers and tests are commencing at RHUL.
2. Problem's with power has been resolved. Was 9W now 28W.
3. Compromise between peak power and average power.
4. Tests over next two weeks to understand / assess power, quality and pulse with regards to the duty cycle and time used on FETS. Tests complete by end of April, report back at next meeting.
5. Start date of laser room installation should be sought.
6. All laser keys to be returned to safety group on return of laser to RAL.

LEBT

1. Pencil beam is mis-aligned by approximately 20mm. A. Hooper to look at alignment with C. Gabor next week.
2. It was suggested that it was an angular issue as opposed to an offset. Although this should not be ruled out.
3. GPT to simulate LEBT beam dynamics and compared to C. Gabor's results. If results do not compare there could be a discrepancy in the actual current. This will be measured and an update given at the next meeting.

MEBT

1. MEBT simulations are continuing. Transmission has increased from 89% to 96.15%. Transmission is the main concern as the higher transmission results in power changes.
2. There is confusion between Linac and ring definitions for power.

Chopper

1. Slow wave electrode development.
2. CERN's micro strip design being developed on ceramic. More stable, higher precision device using photographic process.
3. Old design contained multiple parts.
4. New design beryllium oxide not aluminium oxide. Results in Increased width, 40mm to 53.12mm, due to lower Er and increased thickness from 0.26mm to 0.54mm.
5. Machined pocket and addition of suspended micro strip all under vacuum.
6. Next step is to manufacture prototype.

Magnets

1. Each quad requires 1200W, 15 turns / coils and 300A.
2. Bore size now 46mm which gives less space for turns.
3. Cheapest power supply costs are £1400 per magnet for a total of 7 quads. Total cost estimate for each quad is £7k.

Cavities / Integration

1. There has been progress with the MEBT design, re-bunching cavities and coax delivery system.
2. The goal is to test 1 re-bunching cavity with coupler by end of year 2013.
3. A summer student will be based at Imperial working on chopper beam dump design.

AOB

No recorder AOB.

Actions:

1. S. Alsari to confirm specification of tee piece.
2. S. Alsari, P. Savage, M. Dudman to confirm RF layout. M. Dudman to update at next FETS meeting.
3. A. Letchford, P. Savage to progress design of coupler.
4. S. Jolly to confirm decision on BPM's at next meeting.
5. M. Dudman to enquire on status of laser.
6. C. Gabor to ensure safety group has all laser keys when returned to RAL.
7. C. Gabor to look at beam alignment with A. Hooper.
8. C. Gabor / J. Back to give update on LEBT beam diagnostic results.
9. M. Clarke-Gayther to progress prototype design.