· Apologies from: Jaroslaw, you, Hywel and Will.

· No discussion on accelerator physics progress.

· Clive Hill presented engineering work in progress in 3 areas:

o **Laser target chamber horizontal beam concept**

§ Horizontal beam layout preferred over the vertical beam layout from an engineering viewpoint, relating to the reduced height and orientation of the optics relative to the precision slide that moves accurately and repeatably mirror 3 and the AOP.

§ Precision slide provides space between the target and the nozzle for the camera inline orientation, diagnostics and larger target assembly yet to be defined.

§ Table of motions required with ranges, …….

§ We are ready for the face to face meeting discussed at the previous meeting with Ross, Nick & Chris. **ACTION: Colin** to arrange the meeting.

o **Low energy line layout**

§ Gabor lens location question resolved. Work continues with extra elements to be added with reference to the schematic layout.

o **FETS FFA vacuum chamber**

§ CAD model for FEA of the chamber to inform the magnet gap.

§ The FEA work starting week 24 July when Mitchell Kane (PME group DL) when he returns from holiday. The chamber width is determined by the large beam excursion ~600mm. Current magnet gap is 140 mm, trim coils 20mm. Vacuum chamber internal 82 mm, external 98 mm, wall thickness 8 mm. Allowance required for clearance, wall thickness tolerance, weld distortion, chamber vacuum load deflection.

§ The FEA will determine the deflection and inform if the magnet gap is realistic. Chamber design considers worst case arrangement. Extra components like; septums, kickers, diagnostics will stiffen the chamber.

§ Full penetration electron beam welding at the 4 corners of rectangular chamber considered for low distortion.

§ To reduce vacuum load deflection 2 stiffening ribs are shown. One across the full span of the chamber. Potentially a 2^{nd} half rib between a tapered gap between the coils, if space allows.

§ Bellows will be required to integrate into the chamber, race track shape next to selected flanges, rectangular with provision for both viton and aluminium wire seal. This work will help with the LhARA chamber when we are ready, since the CAD work is parametric.

§ FETS FFA parameters relating to the vacuum chamber below.

· ACTION: **Ken/Neil** to discuss with Hywel to establish if there is any potential short term accelerator physics support on the FFA design.

· Priority over the next week will be the UKRI IF preliminary activity 2 (PA2) funding bid that has a deadline 21st July. Resource requirements for WP1.6 will need to be established in the Summer months ready for an amendment to the PA2 bid before the IAC meeting in early December 23.

· Hywel presenting ITRF at the IET Medical Accelerators, at ICRC Royal Marsden, tomorrow (12th July).

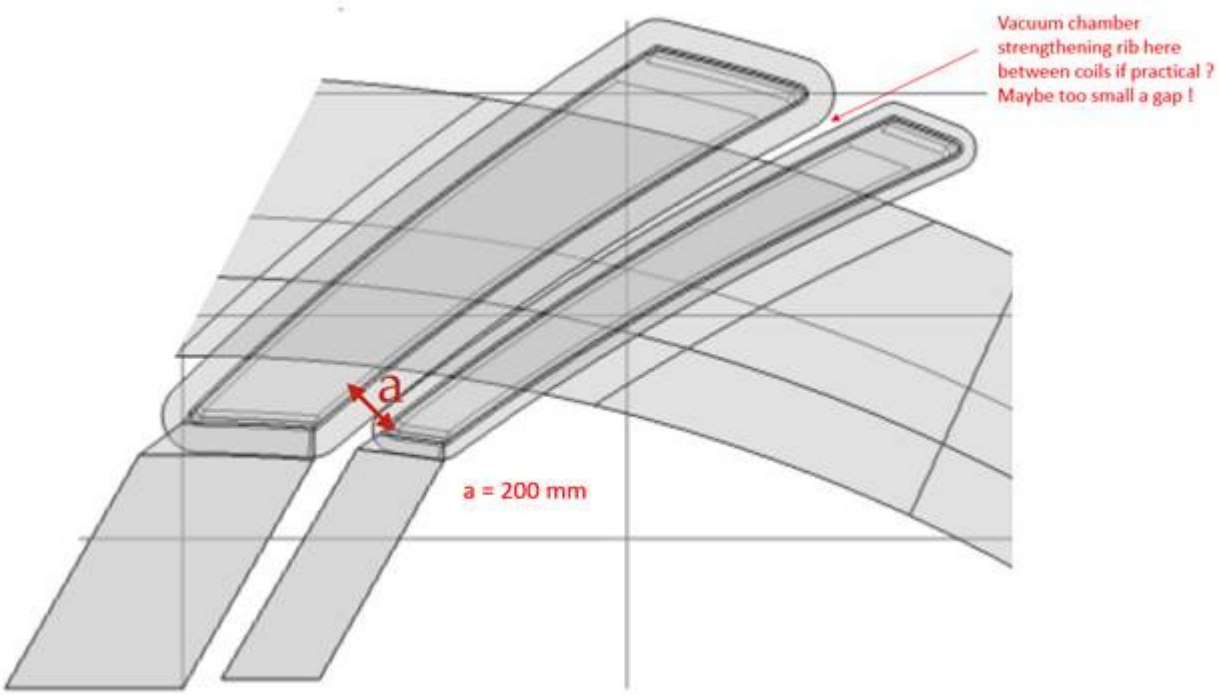
· AOB - none

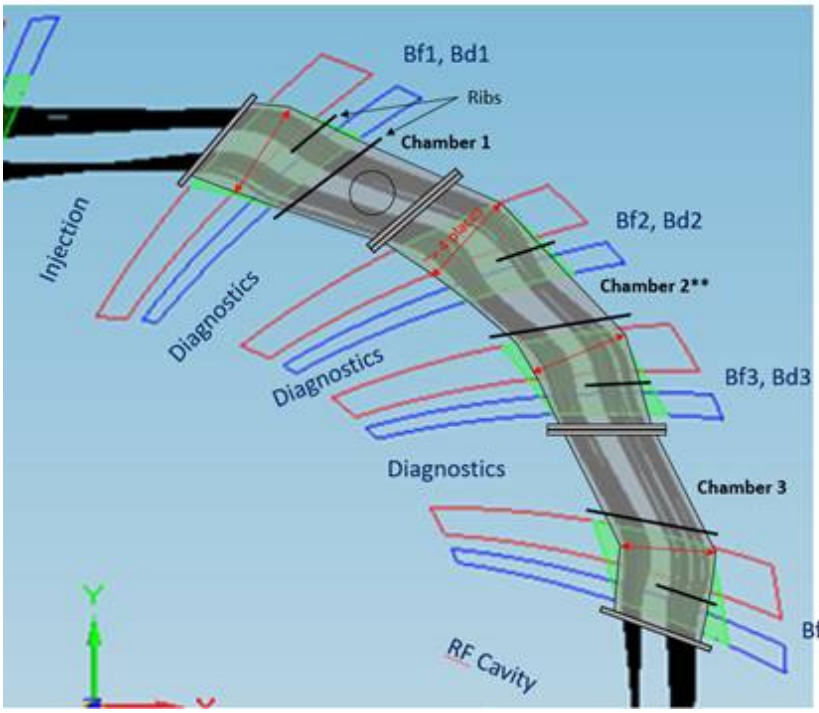
Table 2.8: Horizontal aperture without operating point of Q_y=3.76

	doublet 1	doublet 2	doublet 3	doublet 4
orbit radius $_{min}$ [m]	3.5835	3.7143	3.6684	3.5900
orbit radius $_{max}$ [m]	4.1433	4.2526	4.2291	4.1831
orbit excursion [mm]	560	538	561	593
physical acceptance (fixed momentum) [mm]	± 40	± 40	± 40	± 40
closed orbit distortion [mm]	±8	±8	±8	±8
beam stay clear $_{inside}$ [m]	3.5355	3.6663	3.6204	3.5420
beam stay clear $_{outside}$ [m]	4.1913	4.3006	4.2771	4.2311
beam aperture [mm]	656	634	657	689
GFR addition (each for both sides) [mm]	140	140	140	140
iron yoke $_{inside}$ [m]	3.3955	3.5263	3.4804	3.4020
iron yoke $_{outside}$ [m]	4.3313	4.4406	4.4171	4.3711
magnet aperture [mm]	936	914	937	969

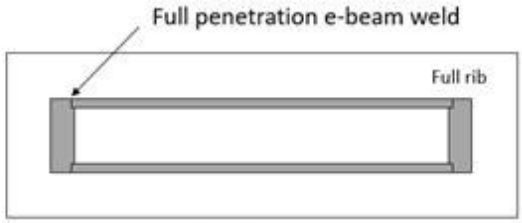
Table 2.10: Vertical aperture

	doublet 1-4
physical acceptance [mm]	±32
closed orbit distortion [mm]	±8
beam stay clear [mm]	±40
vacuum chamber thickness [mm]	10
trim coil thickness [mm]	20
magnet aperture mm]	±70

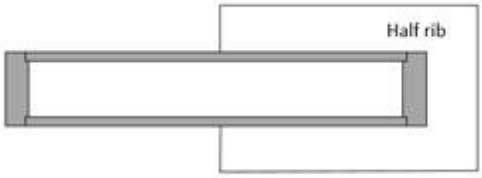




Simplified Vacuum chamber with not too much increase in width



Vacuum chamber cross-section



Vacuum chamber cross-section

Rectangular vacuum flange