CH/Doc/98/03

Minutes

Charissa GANIL Meeting

Held on: Wednesday, 9 December 1998

Held at: Daresbury

Present: WNC, RCL, RAC, GJH

Graham Houghton (Daresbury engineer) was present, to discuss the detailed description provided by the list produced by NAO and WNC on 31 October, together with subsequent input during discussions with RCL, MF and NMC at Daresbury.

The aim was to provide sufficient information for a costing of the construction and the detailed design effort to be estimated.

WNC reported that his discussions with Eurisys had indicated that 5-inch annular detectors were possible. However, in addition, discussions with Colin Wilburn at Micron had indicated that 6-inch technology was available. This would allow the annular detector to be placed 6/5 of the distance from the target relative to that previously envisaged, which would relax the problem of making the central hole small enough. Further, Micron confirmed that they were able to supply strip PSD's that were up to 120 mm in length, and these could be supplied with a width that best suited the TR/A design. Up until now, standard 50×50 mm^2 PSD's had been assumed as a starting point, for the barrel, but the longer ones (possibly narrower at say 45 mm wide) offered many advantages. In order to maximize the advantages of a compact design for detectors around the target, the cost of new masks for different designs of detectors was certainly justified.

Micron had indicated that a variety of options were available for making the connections to the detectors in the barrel, for which the signal extraction presented a challenge due to the space limitations.

Amongst the points agreed during the discussion were the following:

1. The complete assembly of zero degree telescope, forward annular detectors and target-surrounding barrel would be mounted off the back flange,
2. The back flange would comprise a removable inner ring of very thin material extending out to $\pm 25^{\beta}$ to minimize neutron scattering. The outer ring would be substantial to give stability and support the inner detector structure cantilevered off of it,
3. The back flange would be supported on legs which would be connected to rails

that would allow it to be slid back, out of the vacuum vessel, and would allow it to be slid reliably back into position,

4. Electrical feedthroughs for all detectors would exit through the outer ring on the back flange,
5. The target barrel vessel would be of a low atomic number material (aluminium, carbon fibre) to minimise low energy gamma attenuation and would most likely include the sloping walls fanning out to the forward angles; beyond this point it would connect via a flange to the rear (zero degree) module,
6. The side walls of the rear module could be quite thick, for stability,
7. The backplate of the rear module would be 400 mm from the target, to keep compatability with VAMOS,
8. The various detectors in the zero degree module would mount on standard mounting frames/supports that were connected to the inner support rails in a reliable fashion,
9. The annular detectors would be movable and the position measureable, along the beam direction,
10. The zero degree telescope at the rear would be removable for alignment along the beam axis,
11. The central (thin) part of the rear flange would be similarly able to be removed for alignment,
12. The nominal sizes for the separate PPAC vacuum vessels would be cylinders of diameter 200 mm and length 200 mm with entrance and exit beam ports,
13. The PPAC vessel nearer the target would include both a means to mount the annular detector at the backward angles (between the PPAC and the target) and a means of putting the target in position,
14. In view of the difficulty in getting a target in to position, it would only be possible to have one target at a time (plus the no-target situation); hence, it would be necessary to be able to change targets without cycling the vacuum,
15. The target would be mounted on the end of an insertion rod (which would necessarily obstruct part of one silicon detector in the barrel) and could be withdrawn into a transfer port where it could be changed,
16. Different tips would be used on the target insertion rod, according to the appropriate target angle relative to the beam; these would all need to fit through the vacuum transfer valve and any guides for the rod,
17. The rod would have some type of collar that would ensure that it was properly aligned at the point of entry into the vacuum, in the inserted position,

18. The rod could if necessary be in sections as done at ANU, so that it did not create a precarious situation, or foul on other equipment along the beamline when extracted,

19. The means of mounting the Exogam detectors would be based on the regular Exogam support frame, but with any (costly) unnecessary features pruned from the design,

20. Most likely, the framework for only the 90^{β} detectors would be copied,

21. Some support for the vacuum vessels was needed, apart from the beamline, but any connection to the Exogam framework (or its copy) should *not* be to a part that moves when Exogam is opened for access,

22. The TR/A should be able to be used inside the actual Exogam support frame, as well as in the clone of the frame, for G2 beamline running,

23. The clone of the Exogam support structure should be designed to allow running on the D6 LISE platform,

24. A gas handling system to operate the beam tracking PPAC's would be included in the costing,

25. Pumping, probably through the nearer PPAC beam pot, would be included.

It was agreed to meet again in mid-January 1999 to assess the situation and hopefully discuss with the designer. It was hoped that detailed design could commence at the end of January or beginning of February, with a view to producing a rapid costing in time for a March grant submission. $\boxed{\text{RCL,GJH}}$

Pumping and gas handling costs would be estimated. $\boxed{\text{RAC}}$

Check worst-case radioactivity accumulation on target changer. $\boxed{\text{WNC}}$

Details of LPC PPAC designs and beam pots should be obtained and forwarded to GJH, plus details of typical annular detector mount and GANIL beamline diameter. $\boxed{\text{WNC}}$

W.N. Catford 9 December 1998