Bent Model Magnet Dimensions

C. Goodzeit (3/2/07)

Figure 1 shows the concept for construction of the bent magnet proposed for Phase II of an SBIR.

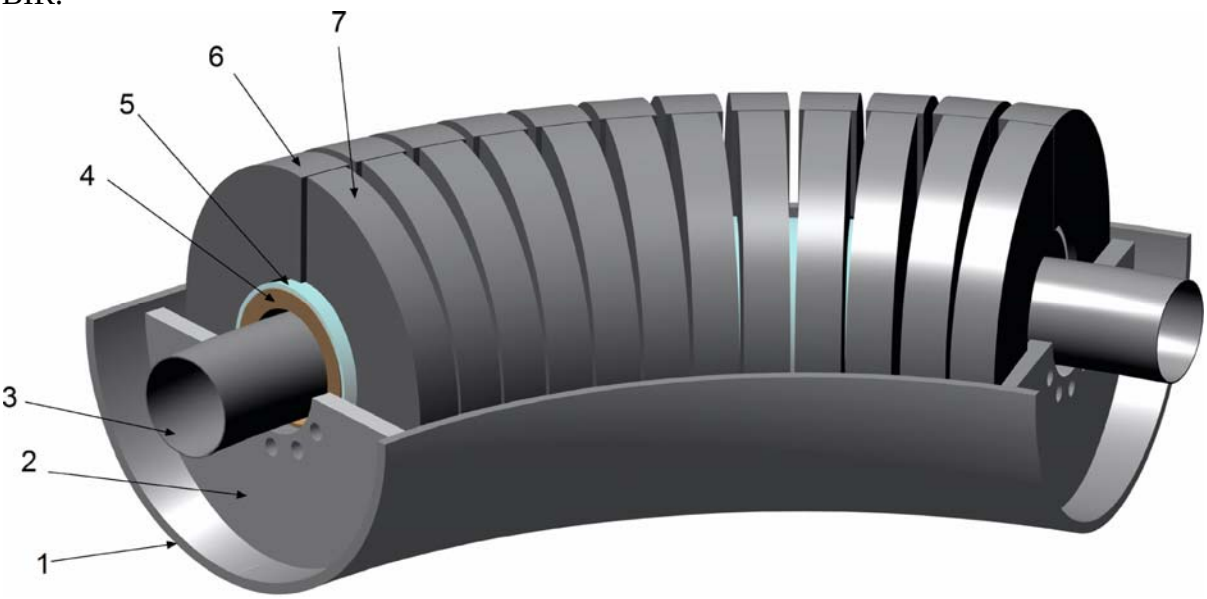

Figure 1. Bent magnet assembly components. 1 – Lower helium containment half shell. 2 – Coil end loading plate. 3 – cold bore tube. 4- Double-helix coil assembly. 5 – Coil insulating spacer with provisions for axial helium cooling flow. 6 – Laminated low carbon steel yoke block (50 mm). 7 – Thinner (40 mm) laminated yoke block. Note: The upper helium half shell and helium containment end closures are not shown.

A full sized model would have the envelope dimensions shown in Figure 2. The 584 mm width (~23 inch) width could be feasible for testing this sized model in one of the vertical test dewars at the national labs. Since FNAL has a 600 mm aperture dewar (M. Lamm, 3/2/07) this would be a good facility for the test. The testing would be in liquid He at 4.2 K. The magnet operating current is 5000 A (4.5 T) and the quench current might be 5500 A. The testing would include:

- Quench performance studies
- Field measurements in the central part of the magnet and at the ends.

Since this is a curved magnet, a special magnetic measurement probe and warm bore insert would be required. We believe that we can come of with some suggestions on how to do this. The open aperture of the coil is 100 mm,, so there is room to insert a curved tube (warm finger) with probe into the aperture. The probe development can be considered as a subtask to this effort and can be costed separately.

We are trying to finish the proposal by 3/16 and would required the cost estimate for the test work and probe development within that time scale.

Thus, we appreciate an early reply to this request and hopefully we can have this work done at FNAL. The time period would be about 18 months from now.

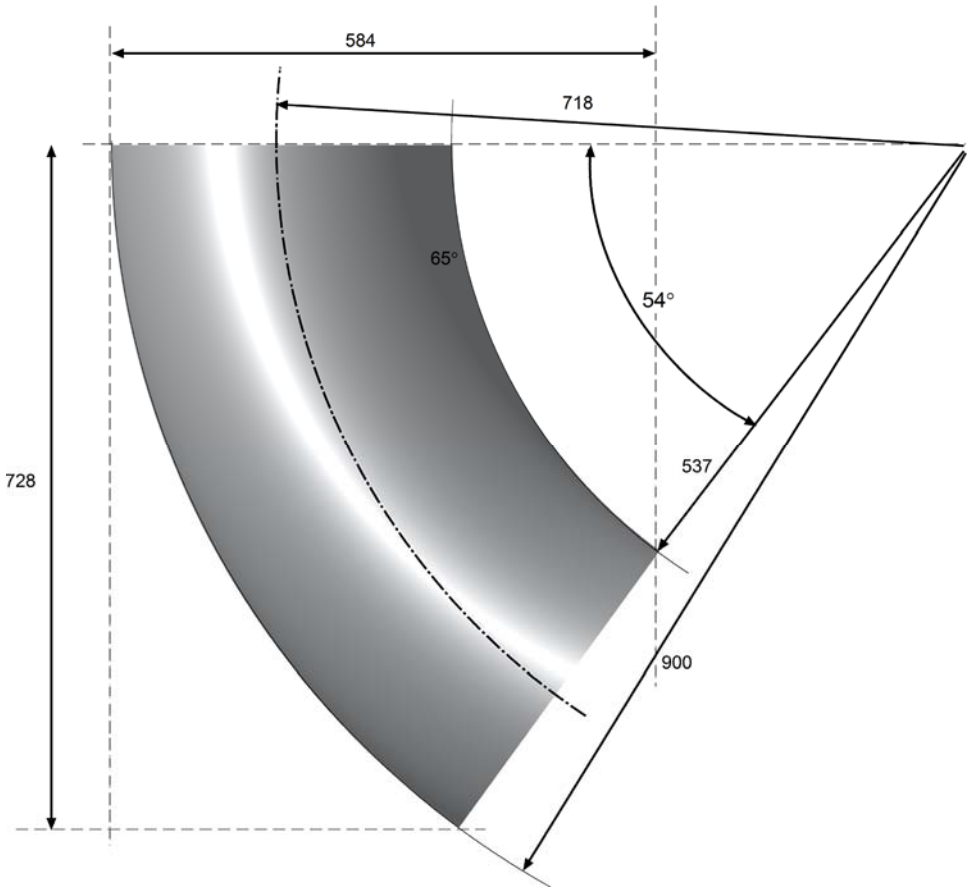

Figure 2. Overall dimensions of bent model magnet proposed for Phase II. (Dimensions in mm)

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