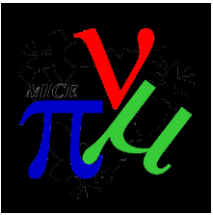


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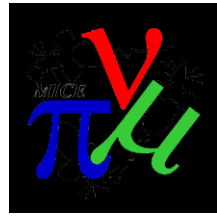


Jason Tarrant - STFC

- Contents

- » Alignment & Survey

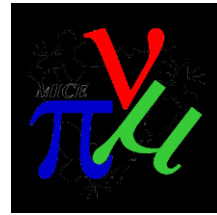
- Task
- Required information (inputs)
- Documents for alignment & survey (outputs)
- Possible installation procedure



- **Alignment & Survey Task**

- » Gather information & produce documents to:

- Aid development of alignment & survey hardware & procedures
- Enable correct placement of equipment during installation (mostly through models & drawings)
- Determine (survey) actual position & include in reference drawings, feedback for simulation etc



● Information Required - Placement

» Perfect placement

- Essential geometry drawing

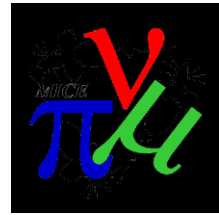
» Placement tolerances

- Physics requirements, e.g.

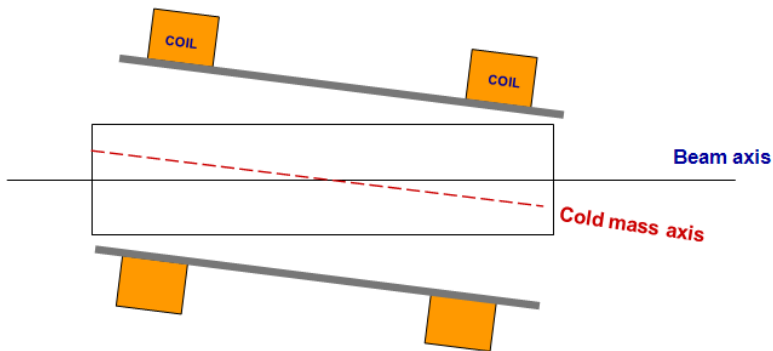
- How well do magnetic centres need to be aligned to experiment centre / beam?

- Mechanical requirements, e.g.

- Ensure when placed that components can be bolted together
- Ensure placement allows rigid / inflexible services to be placed



● Physics requirements



Information
from J Cobb
(Uni Oxf) for
AFC

Axis of cold mass to lie entirely within a cylinder centred on beam axis

Cold mass of Focus Coils is ~670mm long

Cylinder radius of 0.5mm gives maximum tilt of $1\text{mm}/670\text{mm} = 1.6$ milliradians

(This is greater than a notional 1milliradian but well within the 6milliradians rms from alignment study.)

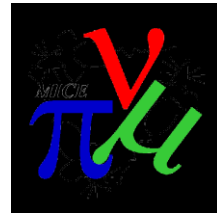
Cold mass of Spectrometer Solenoid is 2544mm long

In this case 0.5mm radius cylinder gives max. tilt of 0.4 mradians

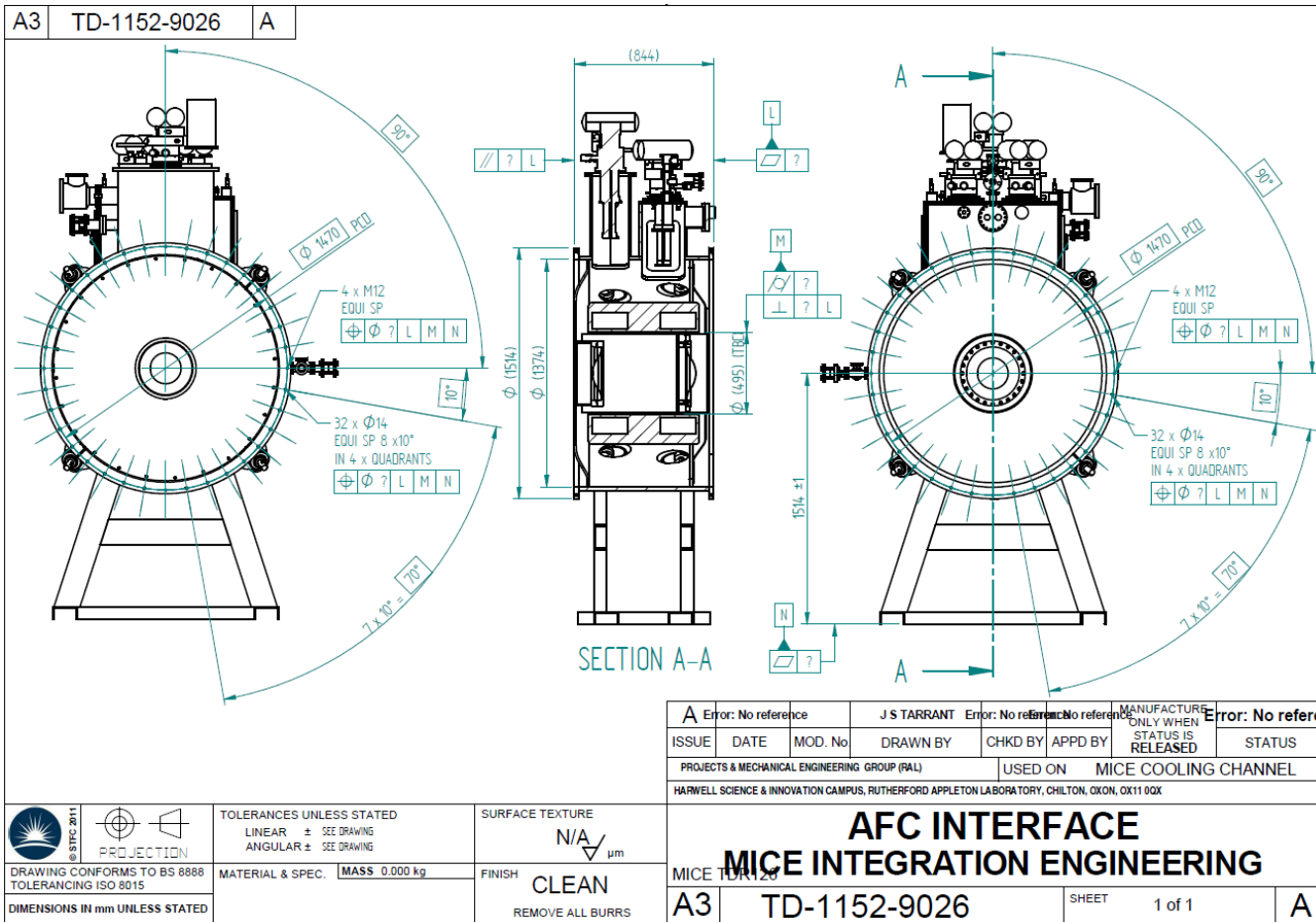
I would propose that axes of the cold masses of the SS and FCs are required to lie within a cylinder of radius 0.5mm around the beam axis

I don't have the dimensions for the cold mass of the CC, but there is only one coil / module so '1mm / 1 mr' should apply; or reduce to 0.5mm / 1mr for consistency with other components.

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Mechanical requirements

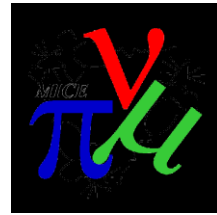


Information requested from TESLA to enable the '?'s (predicted tolerances).

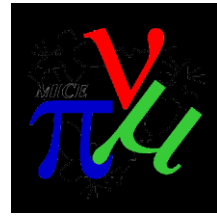
Ideal = actual sizes & shape to be delivered

Interface drawing

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- **Information Required – other mechanical**
 - » 3D Models to create assembly models & drawings
 - » Datum features / references (e.g. fiducials)
 - » Actual size & shape, especially:
 - alignment of magnetic centre to references
 - alignment of interface features to references and/or magnetic centre



- **Documents**

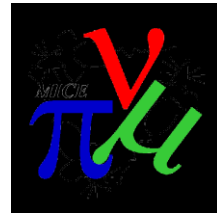
- » **Survey development** models & drawings

- For development of compatible survey hardware & procedures (e.g. magnetic survey deployment system)
- Interact with survey groups

- » **Installation** models & drawings

- For specific installation information & placement requirements for MICE devices, including e.g.
 - Datum features, placement & tolerances etc
- Interact with both magnetic and physical survey groups as well as device developers, infrastructure and installation team

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- Possible installation process

