

# MICE magnet positional tolerances when assembling the cooling channel

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# MICE NOTES

- **229 Alignment Errors on Emittance Measurements for MICE**

David Forrest, F.J.P. Soler

deals with spectrometer alignment (step VI, flip, 200 MeV/c) - gives tolerance of order 10 mm, 3 mrad

- **202 Beamline to MICE Alignment and Matching Tolerance**

C. Rogers

deals with beam alignment to cooling channel (step VI flip 200 MeV/c - gives tolerance of order 2 mm, 10 mrad

- **64 Initial study of MICE Magnet Alignment Requirements**

U. Braver, J.H. Cobb

deals with focus coil alignment (step VI, flip, 200 MeV/c) - gives tolerance of order 2 mm, 2 mrad

Thanks to Chris Rogers and John Cobb for the information

## Conclusion

Different studies, all agreeing with a general tolerance of 1 mm, 1 mrad?

Does this tolerance simply cover our backs?

Can we relax these tolerances for the cooling channel?

seems the order of importance is:

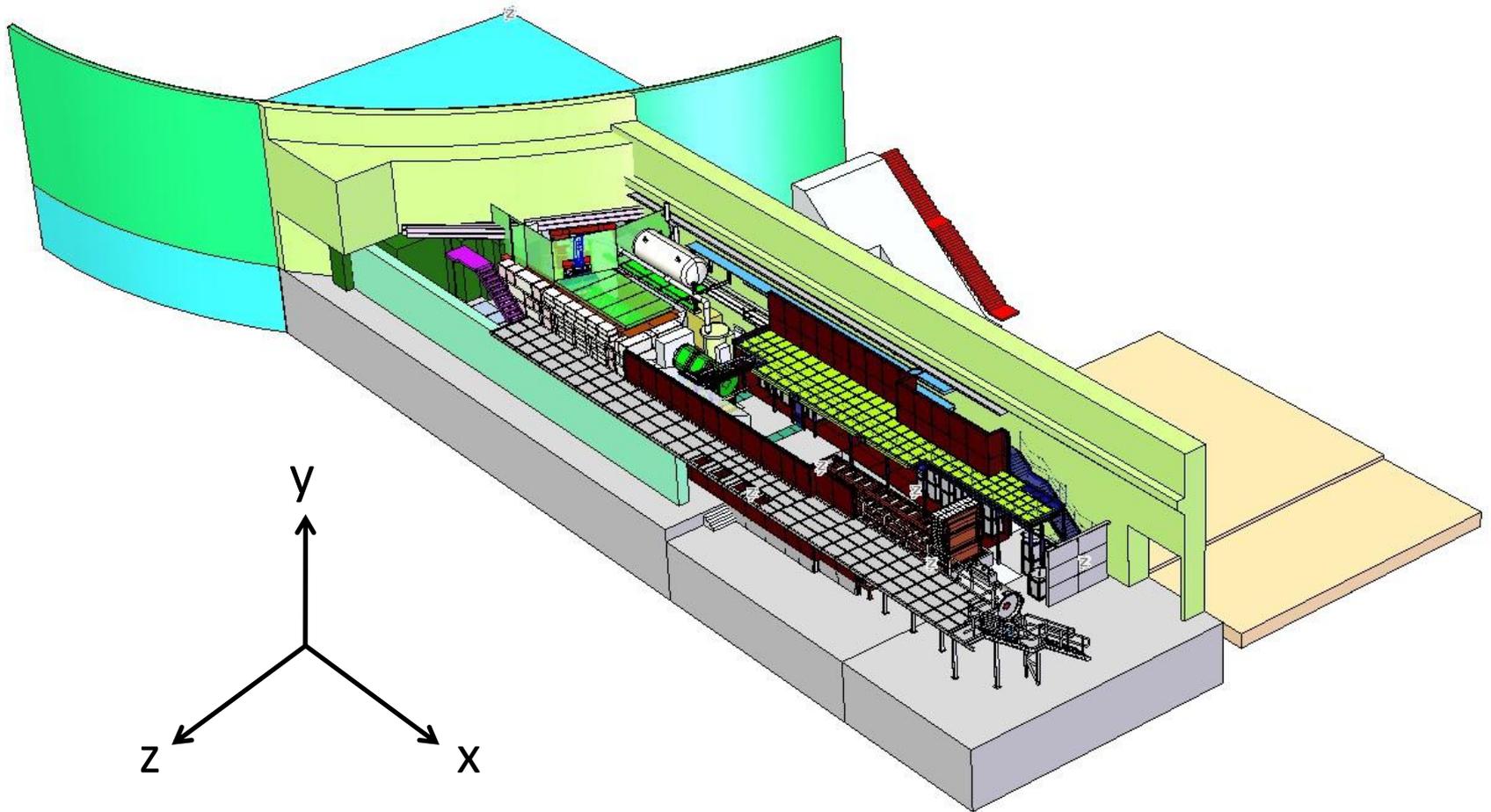
Tilt angle very important

Transverse not so important

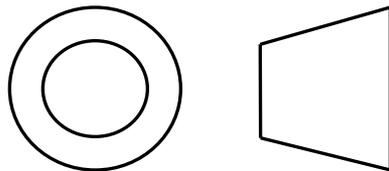
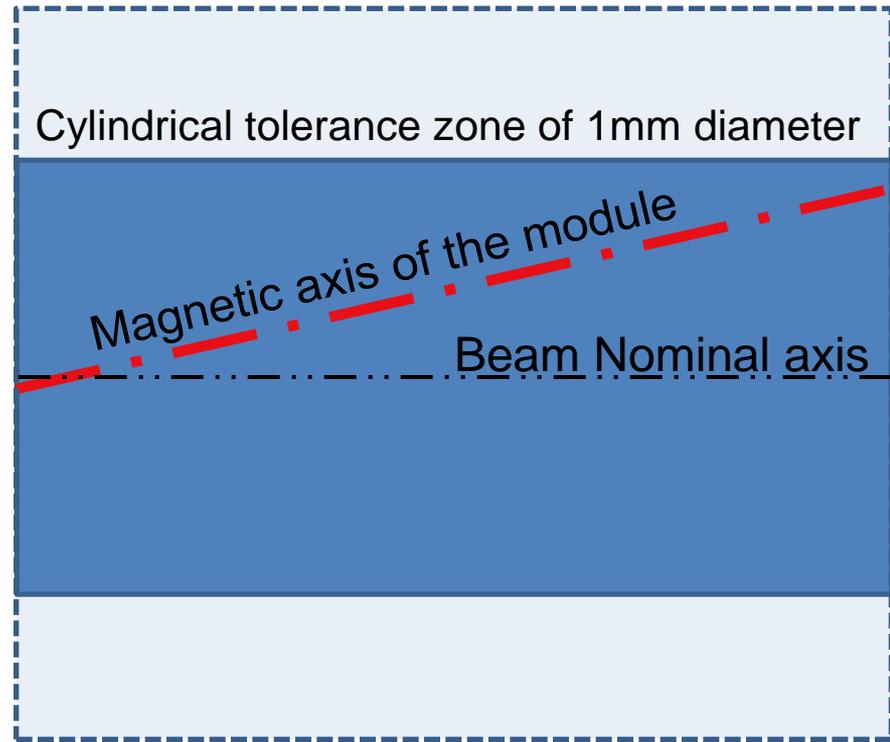
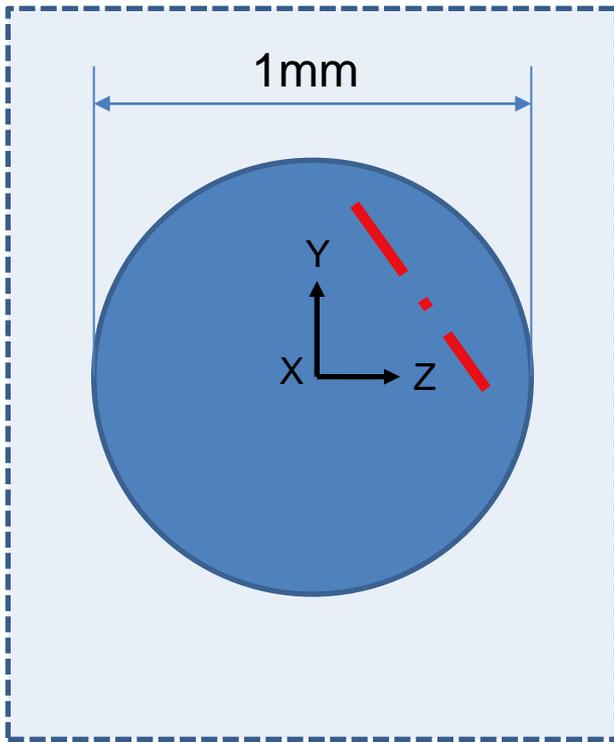
Longitudinal less stringent again

Can we split up the tolerance into these three components?

# MICE Hall CSYS



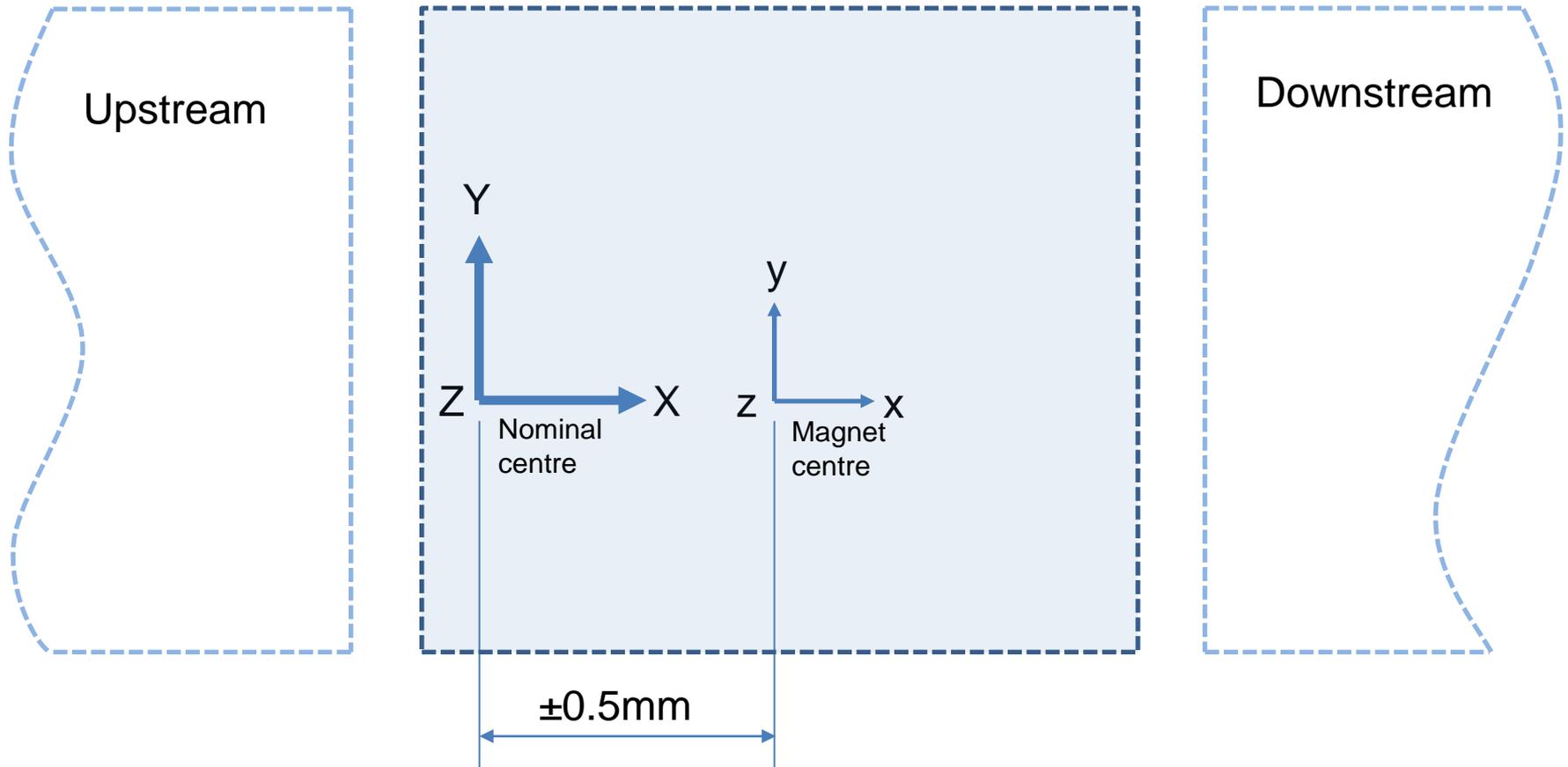
# The position of the magnetic axis with respect to a tolerance zone about the nominal axis



Projection

Reference the MICE hall coordinate system on slide four

# The positional tolerance of the magnet centre longitudinally with respect to the nominal centre



Reference the MICE hall coordinate system on slide four

# Table of positional tolerances

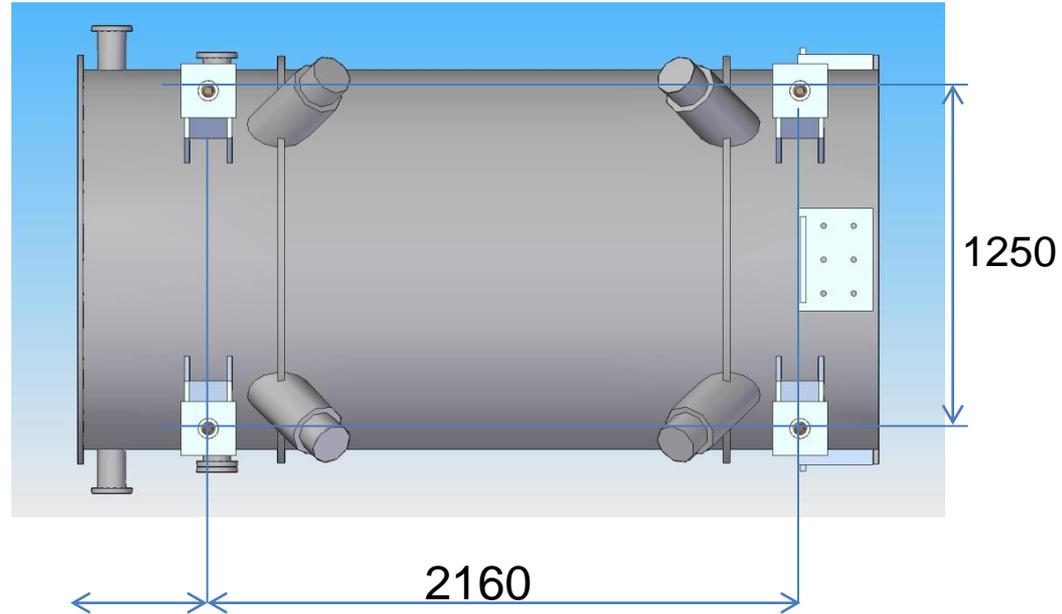
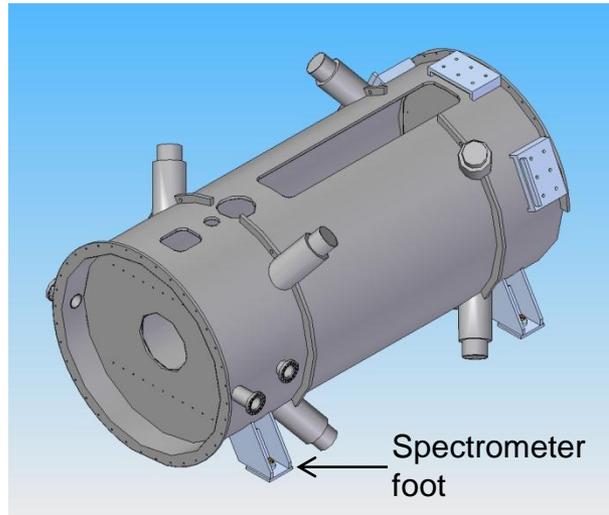
Component	Positional tolerance zone of the magnetic axis with respect to the nominal axis	The positional tolerance of the magnet centre longitudinally with respect to the nominal centre	Comments
Virostek plates	5mm	$\pm 3\text{mm}$	
Spectrometer Solenoid	1mm	$\pm 0.5\text{mm}$	
AFC	1mm	$\pm 0.5\text{mm}$	
RFCC	1mm	$\pm 0.5\text{mm}$	

Potential to relax and split the tolerance zone into tilt and traverse tolerances?

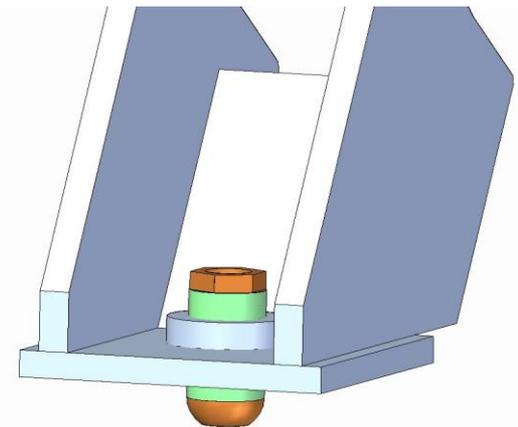
# Spectrometer support frame



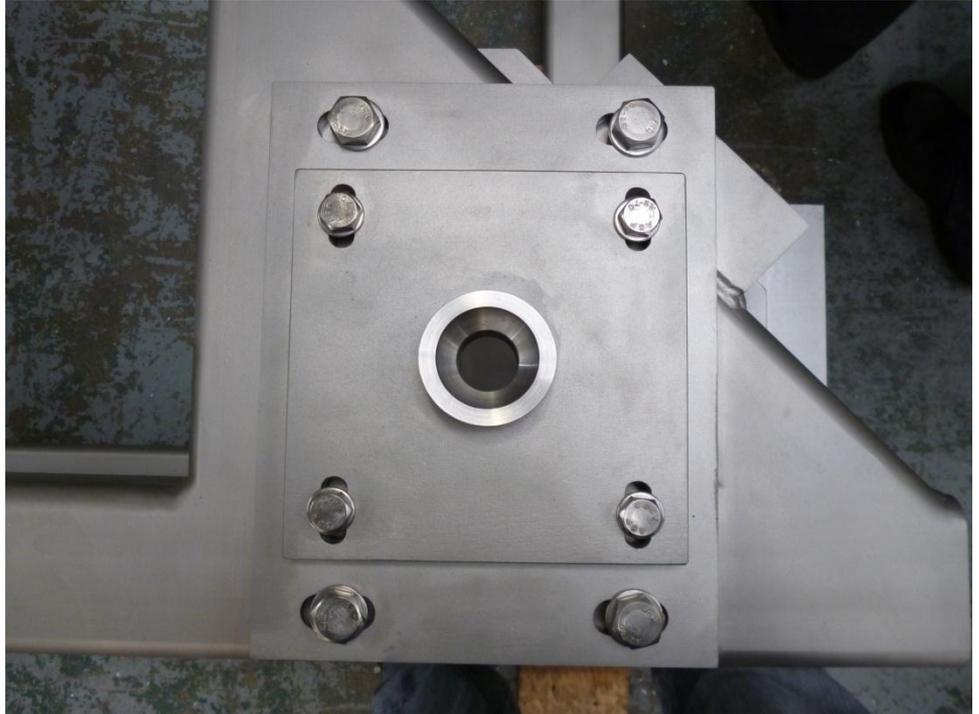
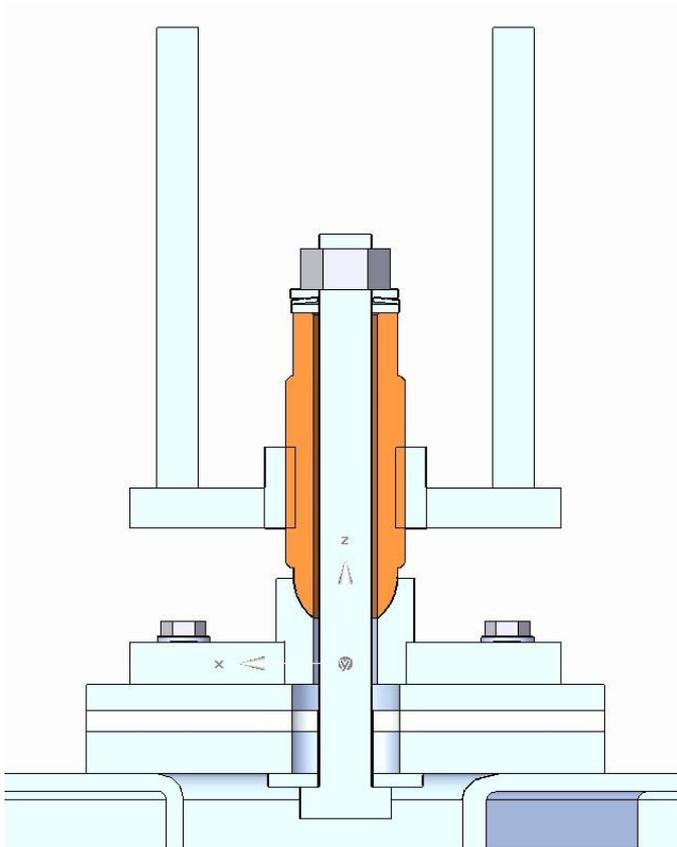
# Spectrometer feet locations



The Spectrometer has four feet, in each foot there is a boss that houses a locating pin. The locating pin is threaded into the boss and can be adjusted in height about its nominal position. A hemispherical dome on the end of the pin locates in a similar hemispherical cup on the support frames.



# Height adjustment



# Longitudinal adjustment



# Traverse adjustment

