AGATA at GSI
30/09/2010

John Strachan

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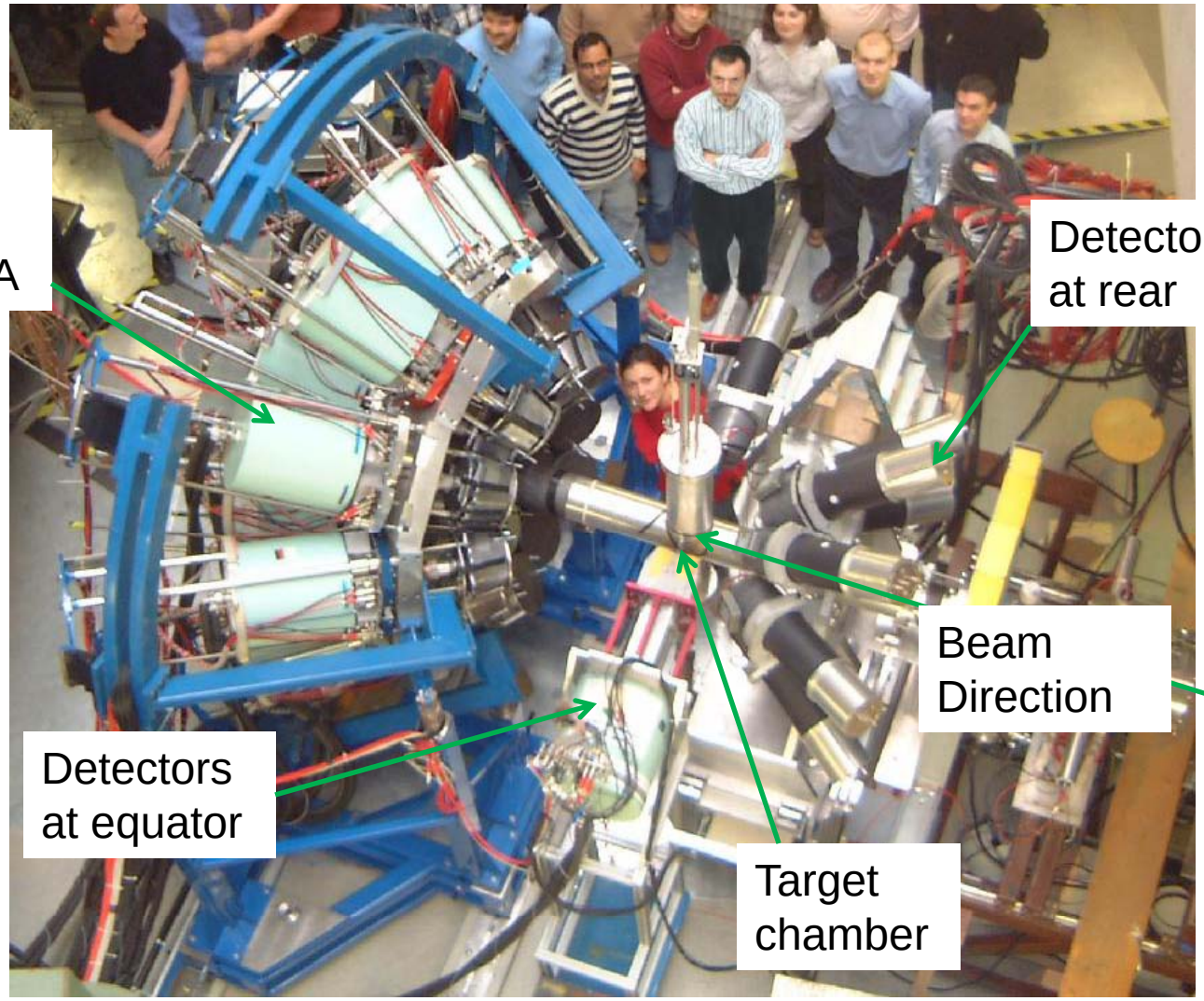
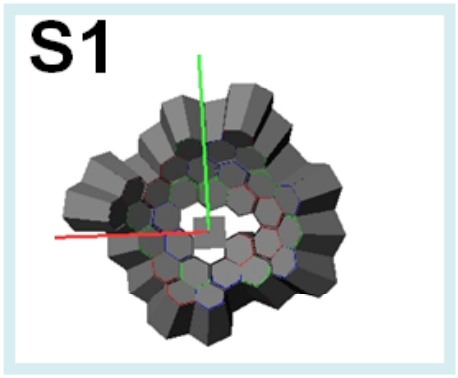
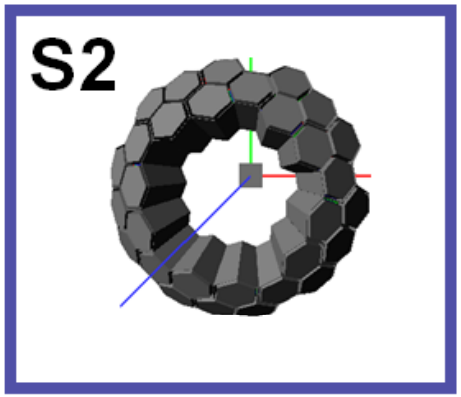
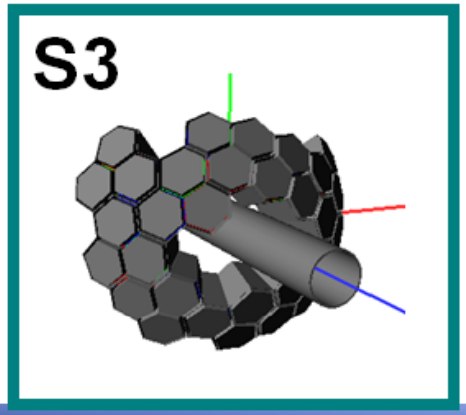
Location

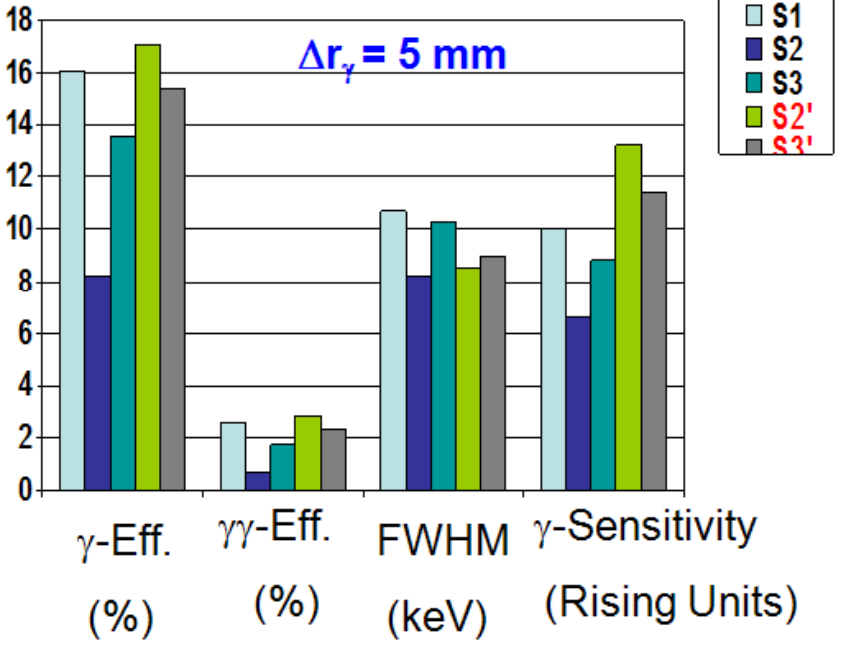


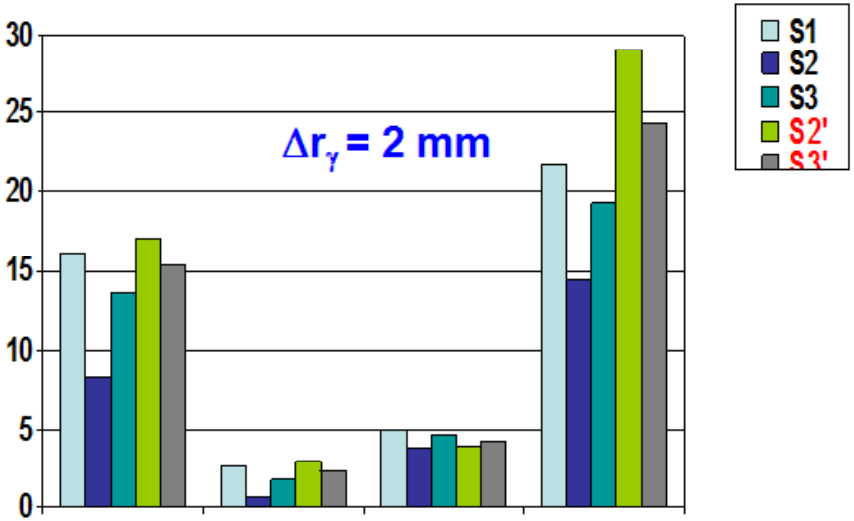
Simulations











Shell Geometries performance comparison: Summary

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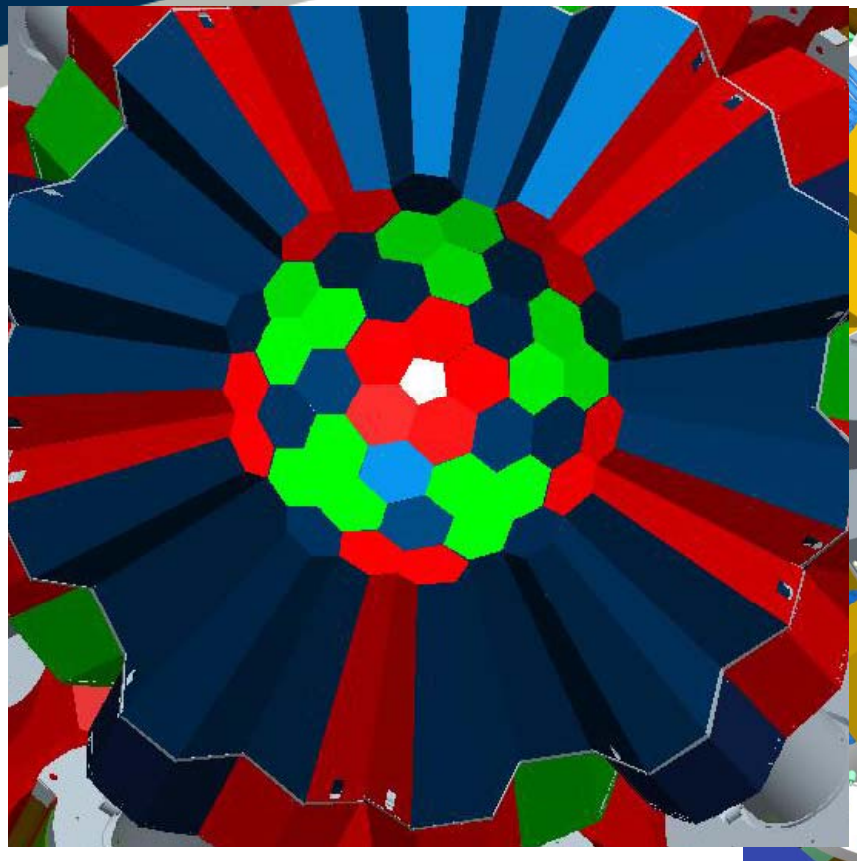
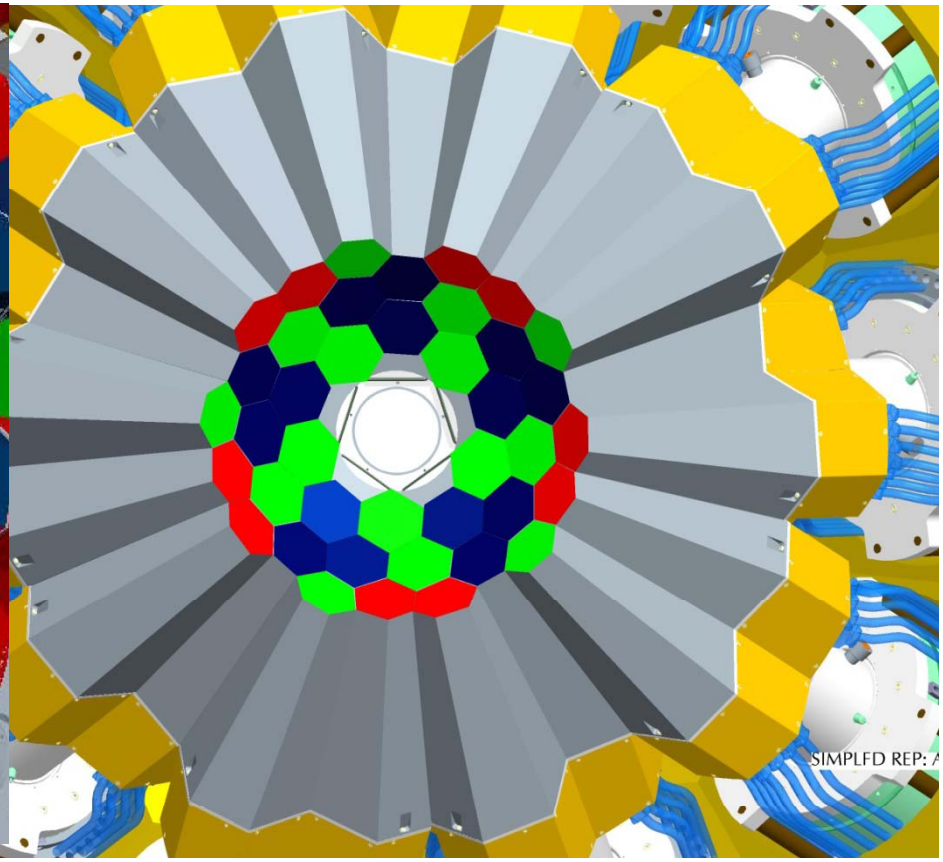
Crystal layout



Existing Arrangement



Proposed arrangement at GSI
Just considering crystals a 130 dia beampipe
Can be accomodated

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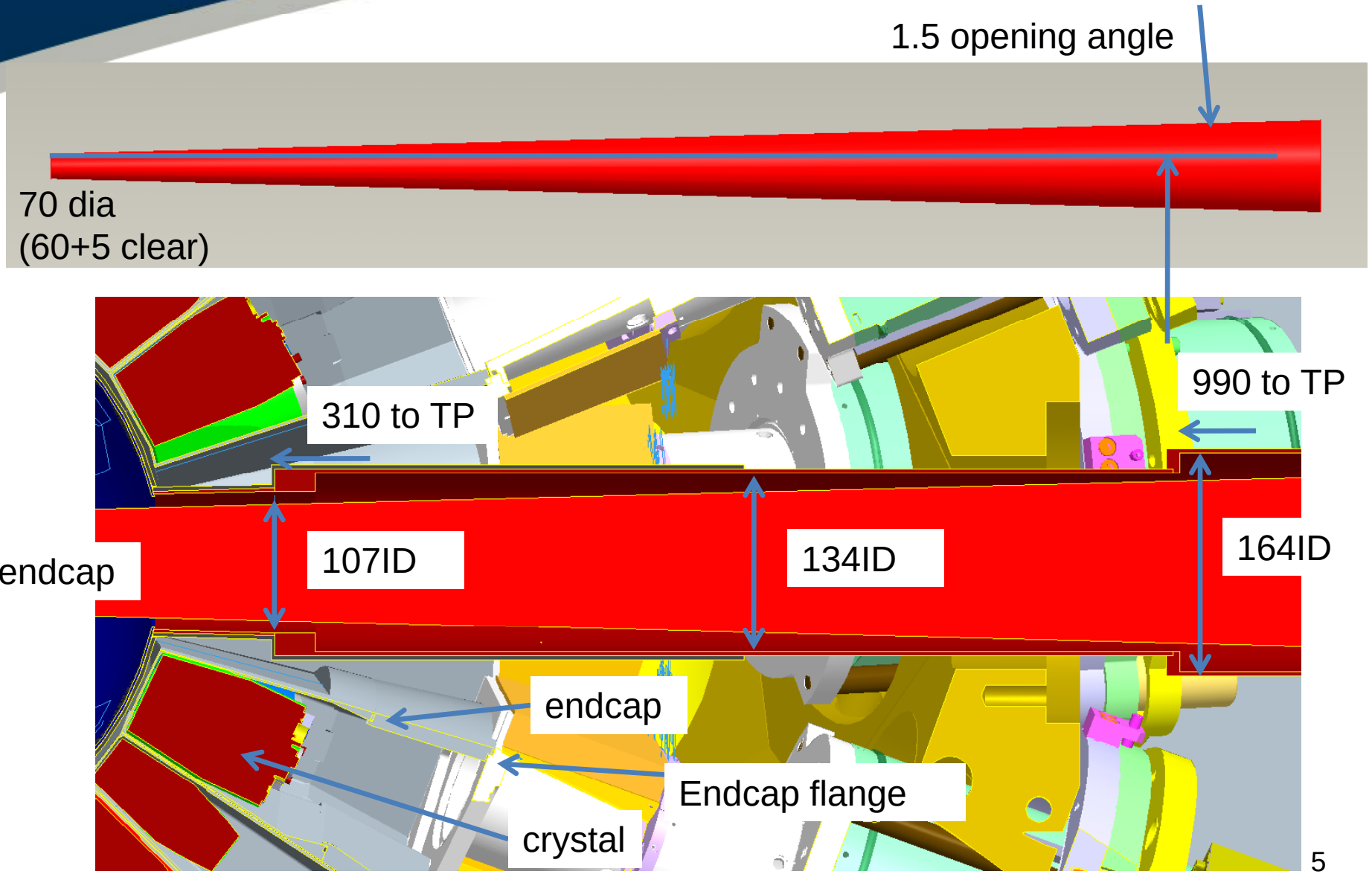
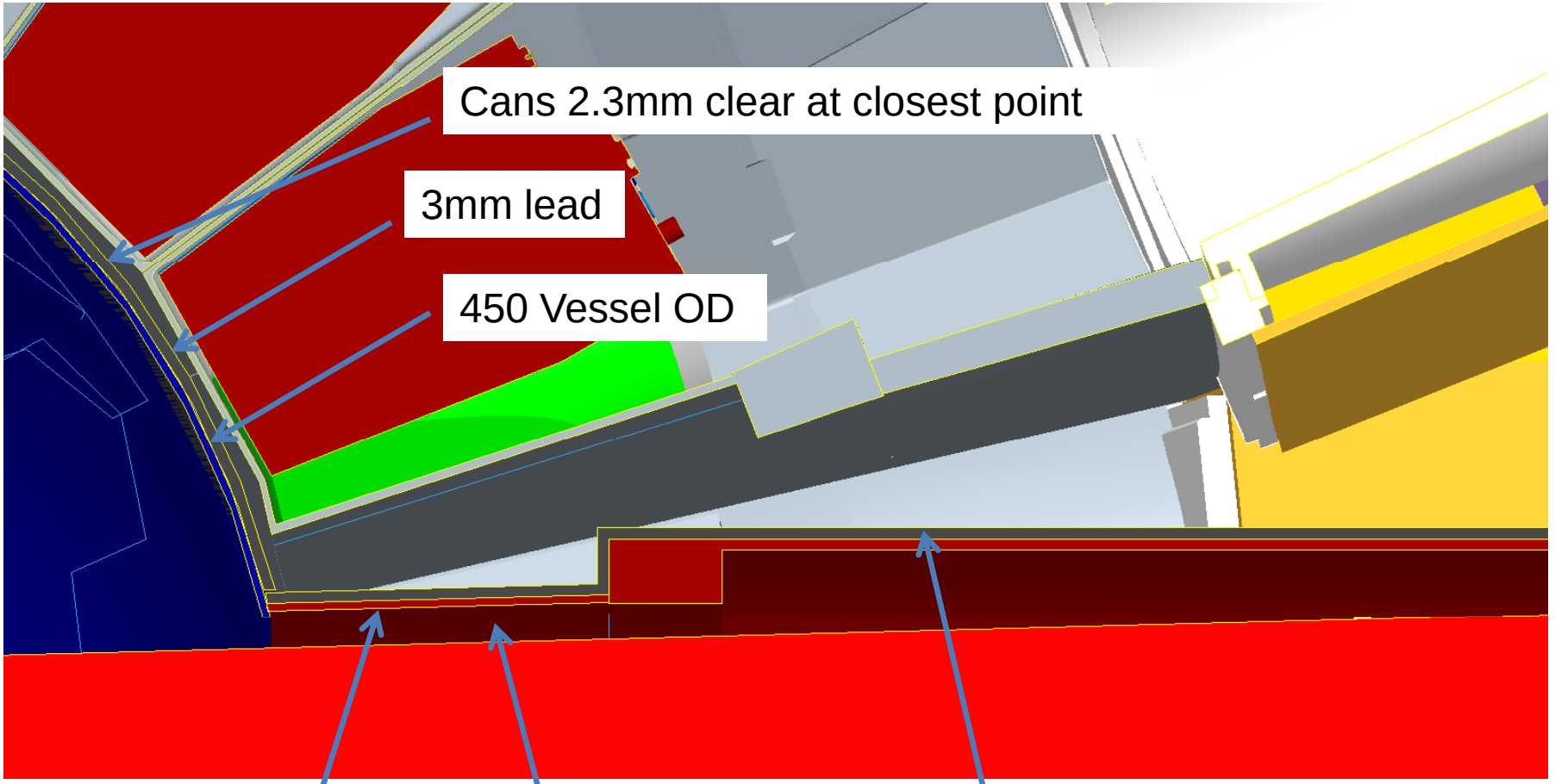
Beam Geometry



Beam Geometry



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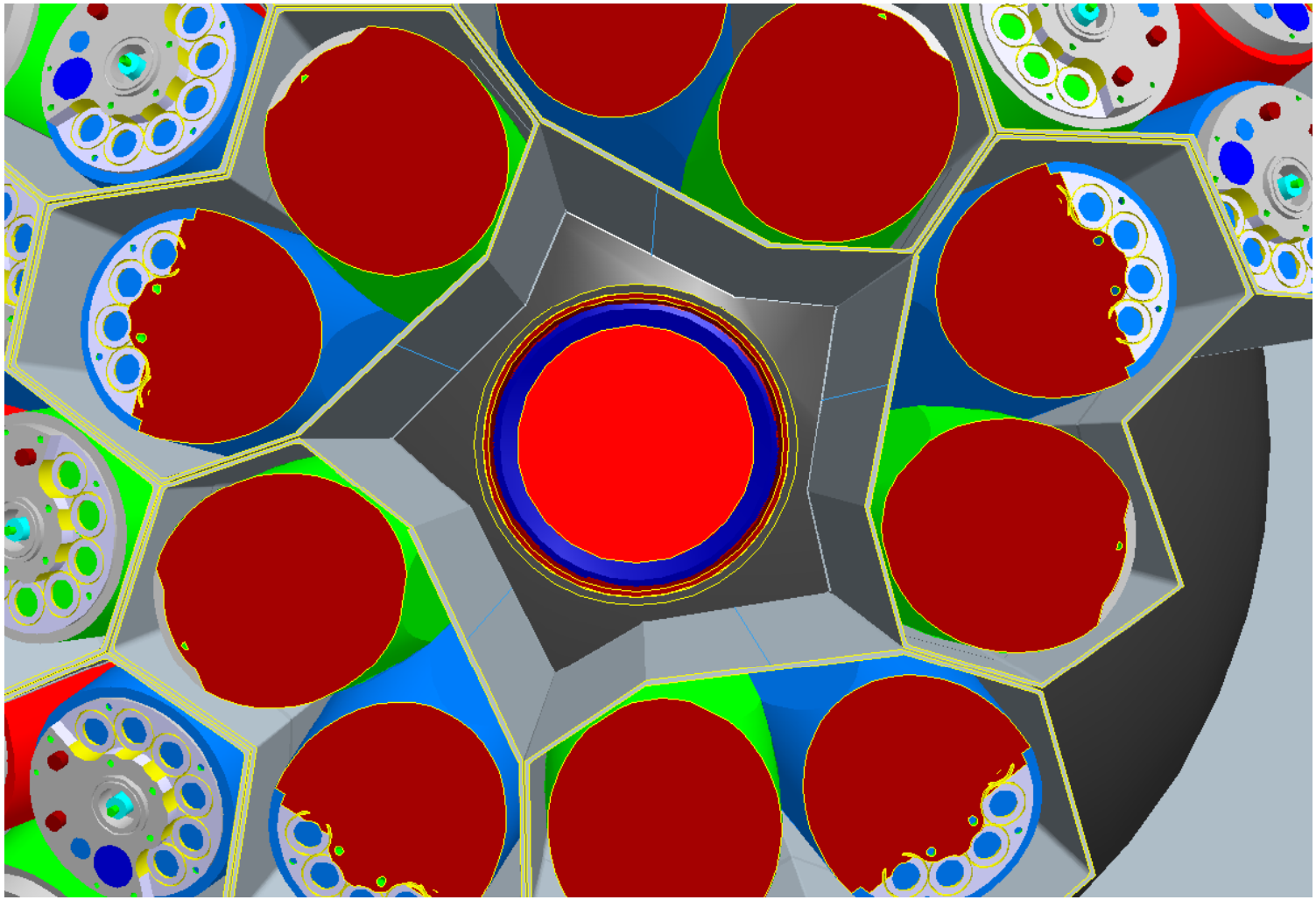
Beampipe Geometry



7mm clearance between tapered pipe and detector cans

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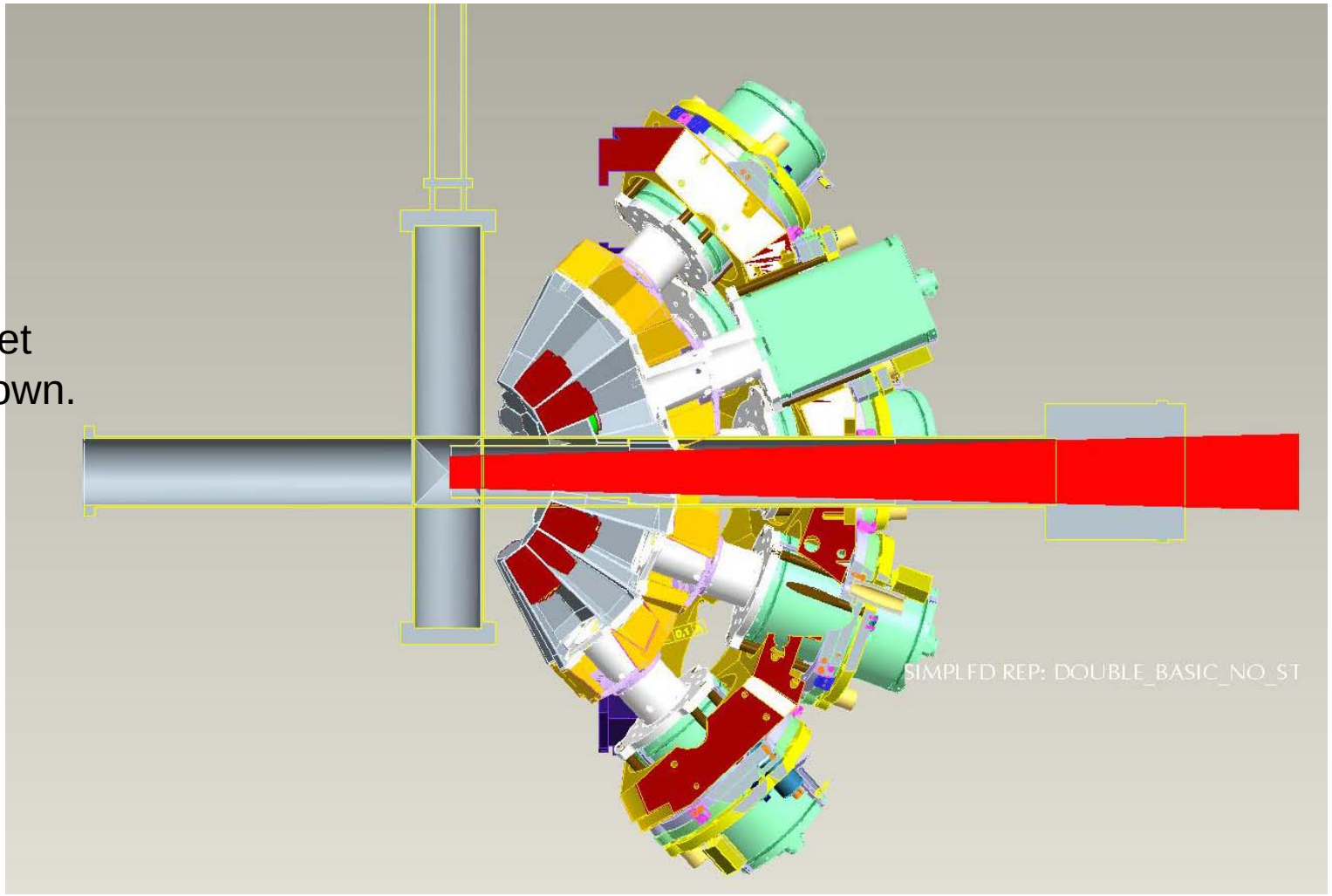
Target Considerations

RISING Target Chamber shown.



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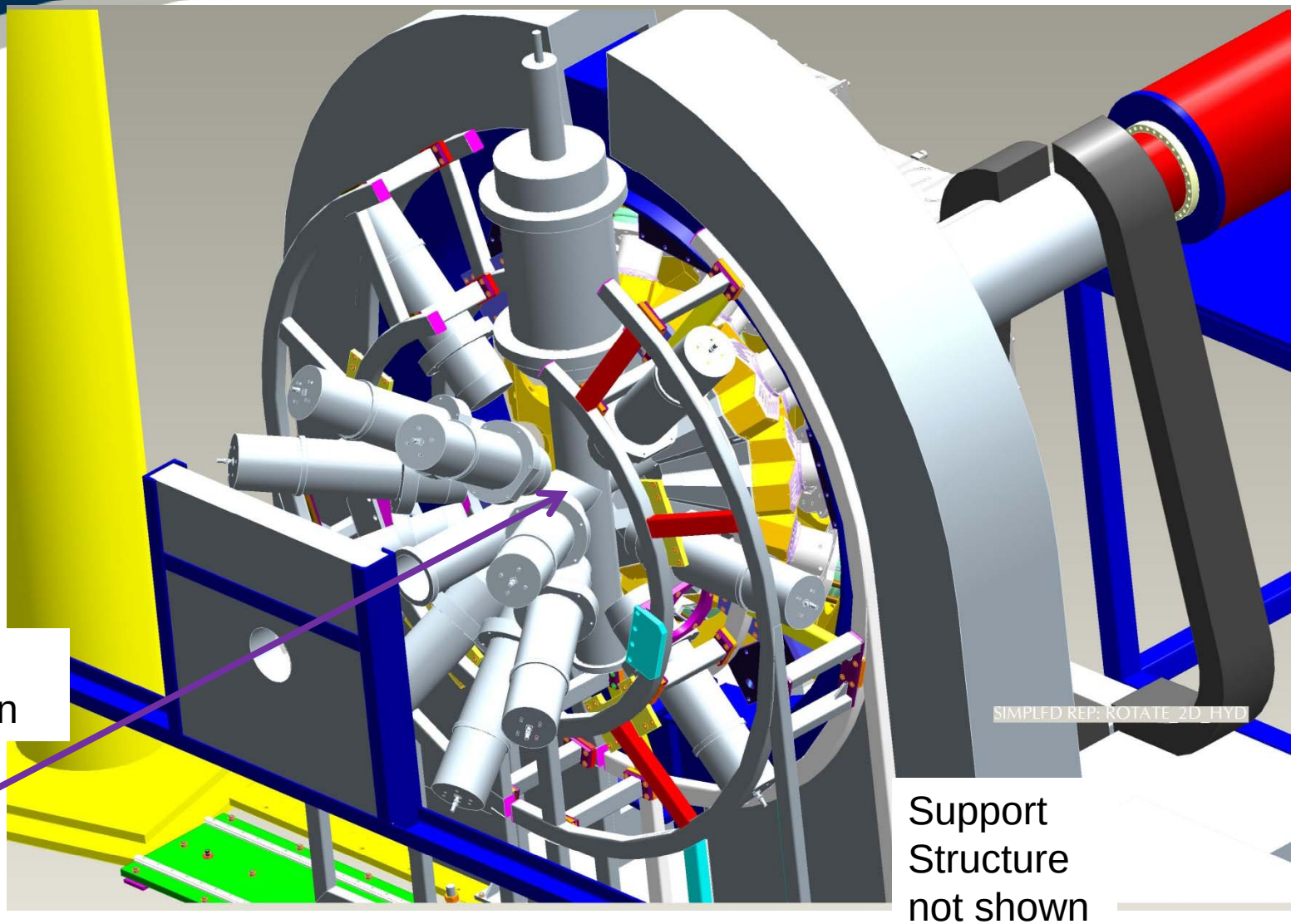
Hydrogen Target



Beam Direction

Support Structure not shown

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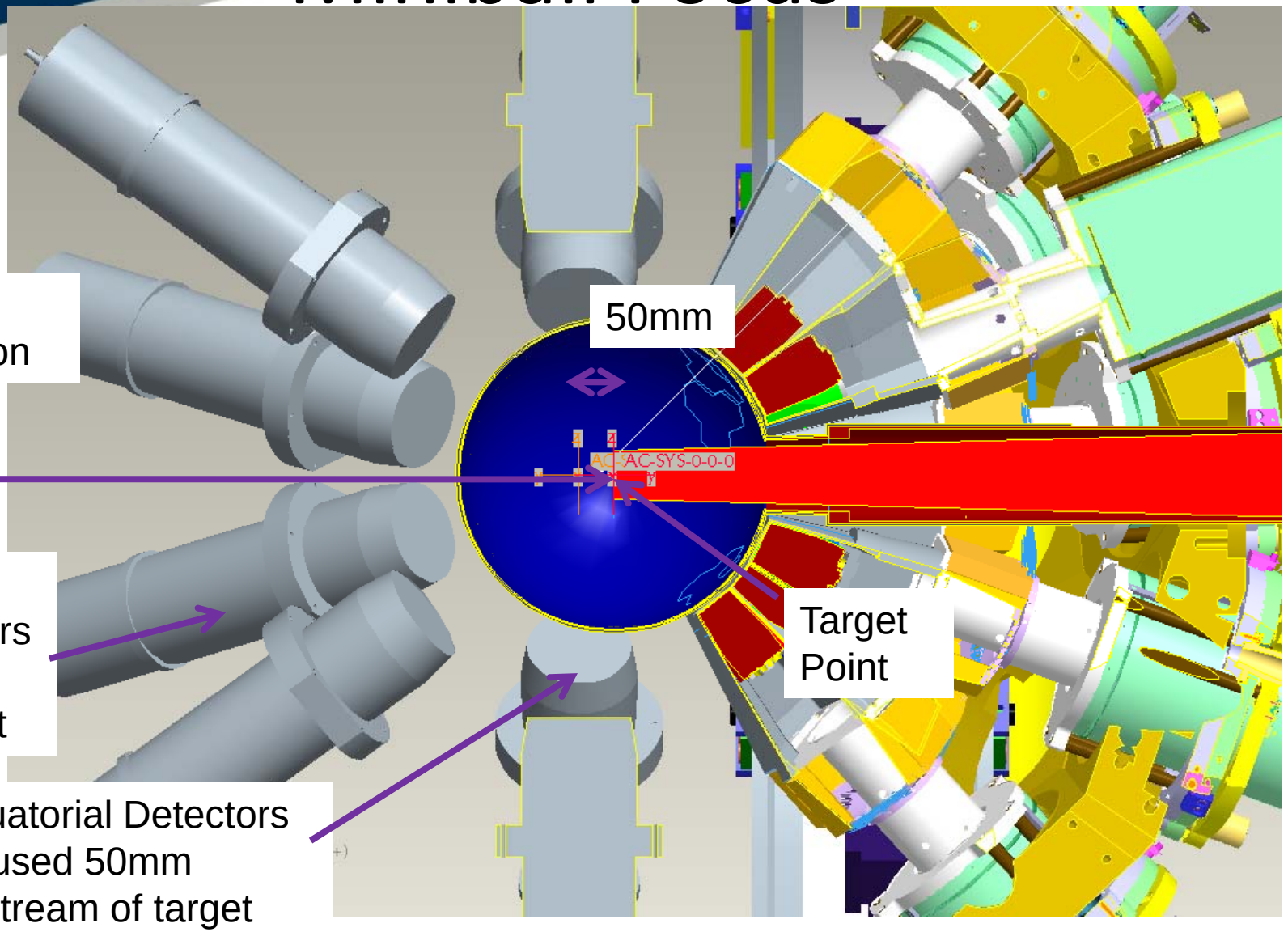
Miniball Focus



Beam Direction

Rear Detectors focused at target

Equatorial Detectors focused 50mm upstream of target

Target Point

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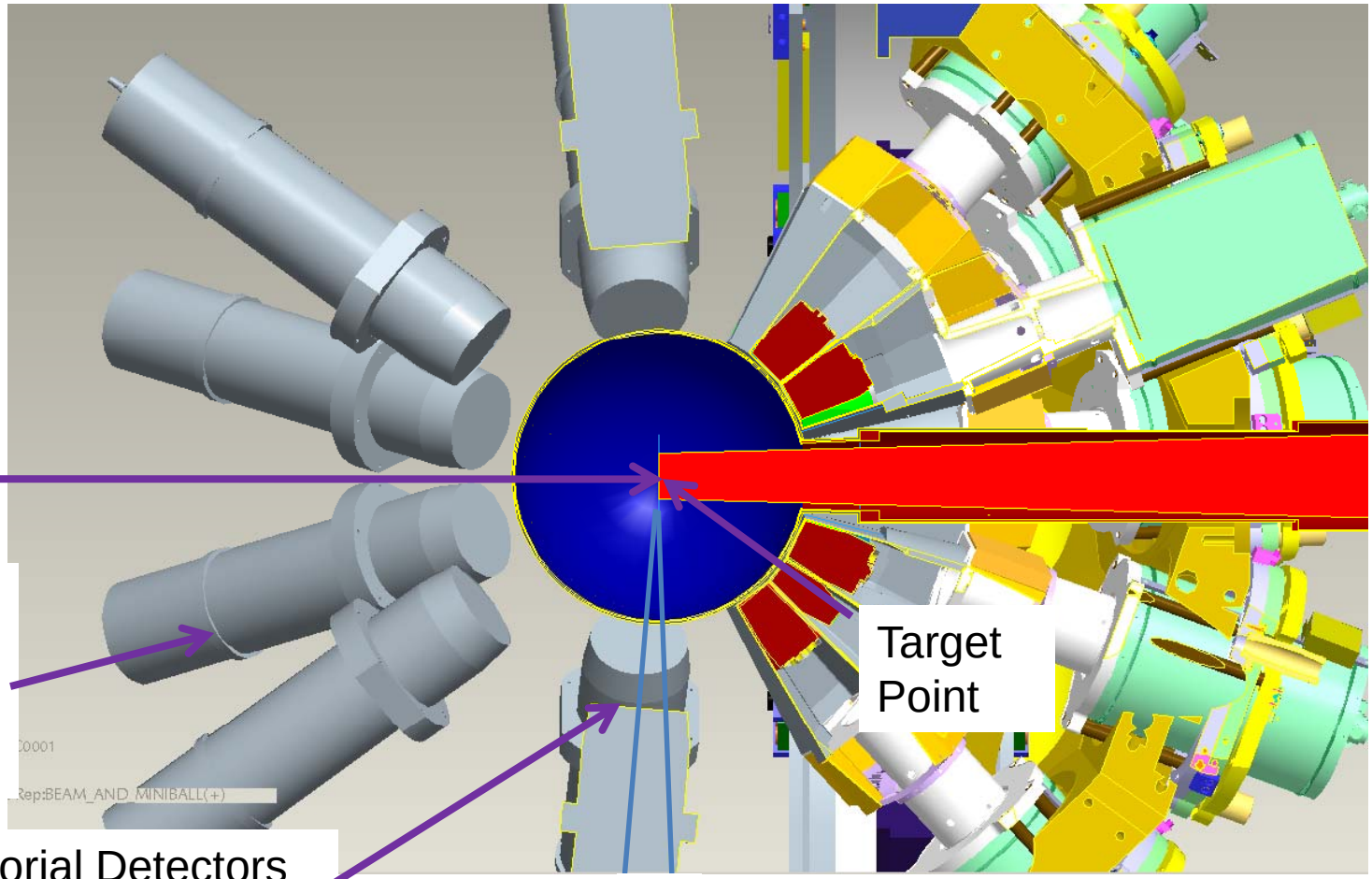
Miniball Focus



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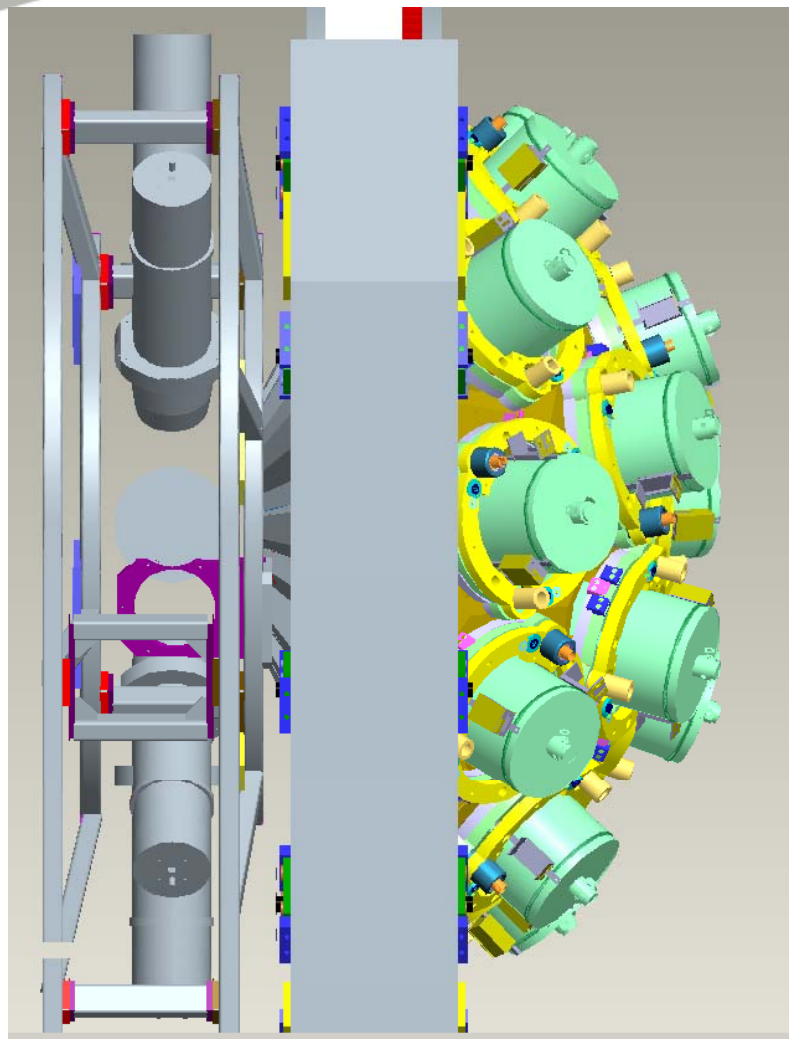
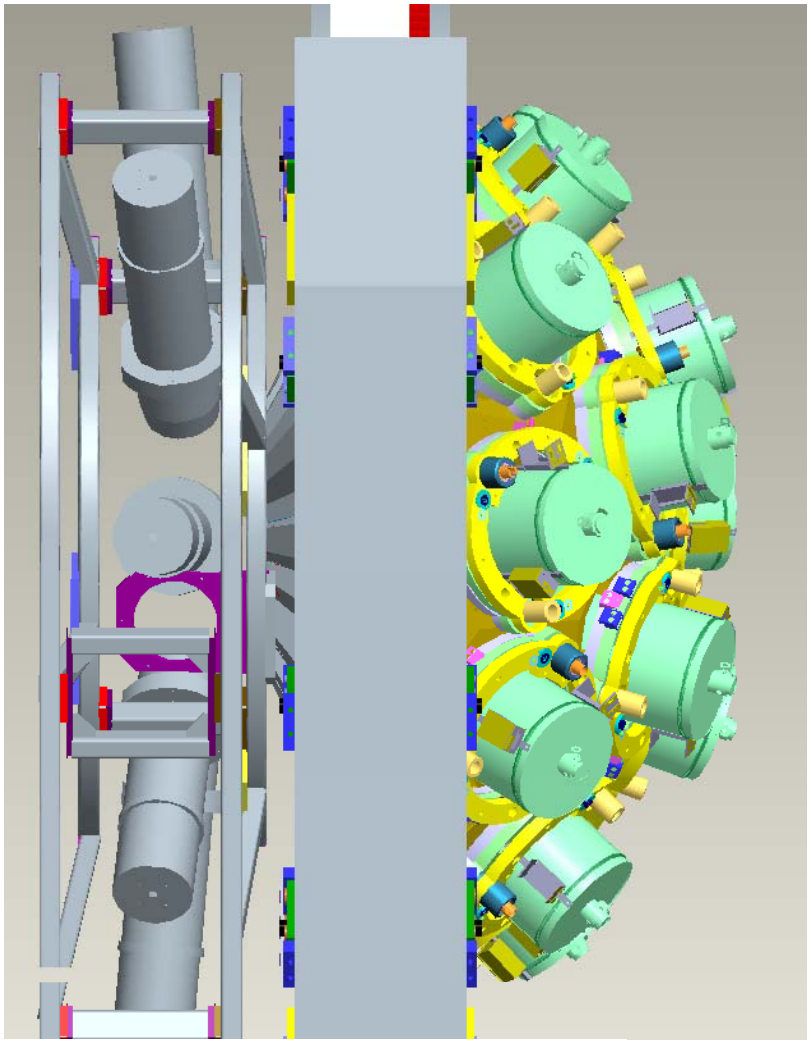
Miniball Frame



Linear Detectors focused at 50mm upstream from target



Canted Detectors focused at target

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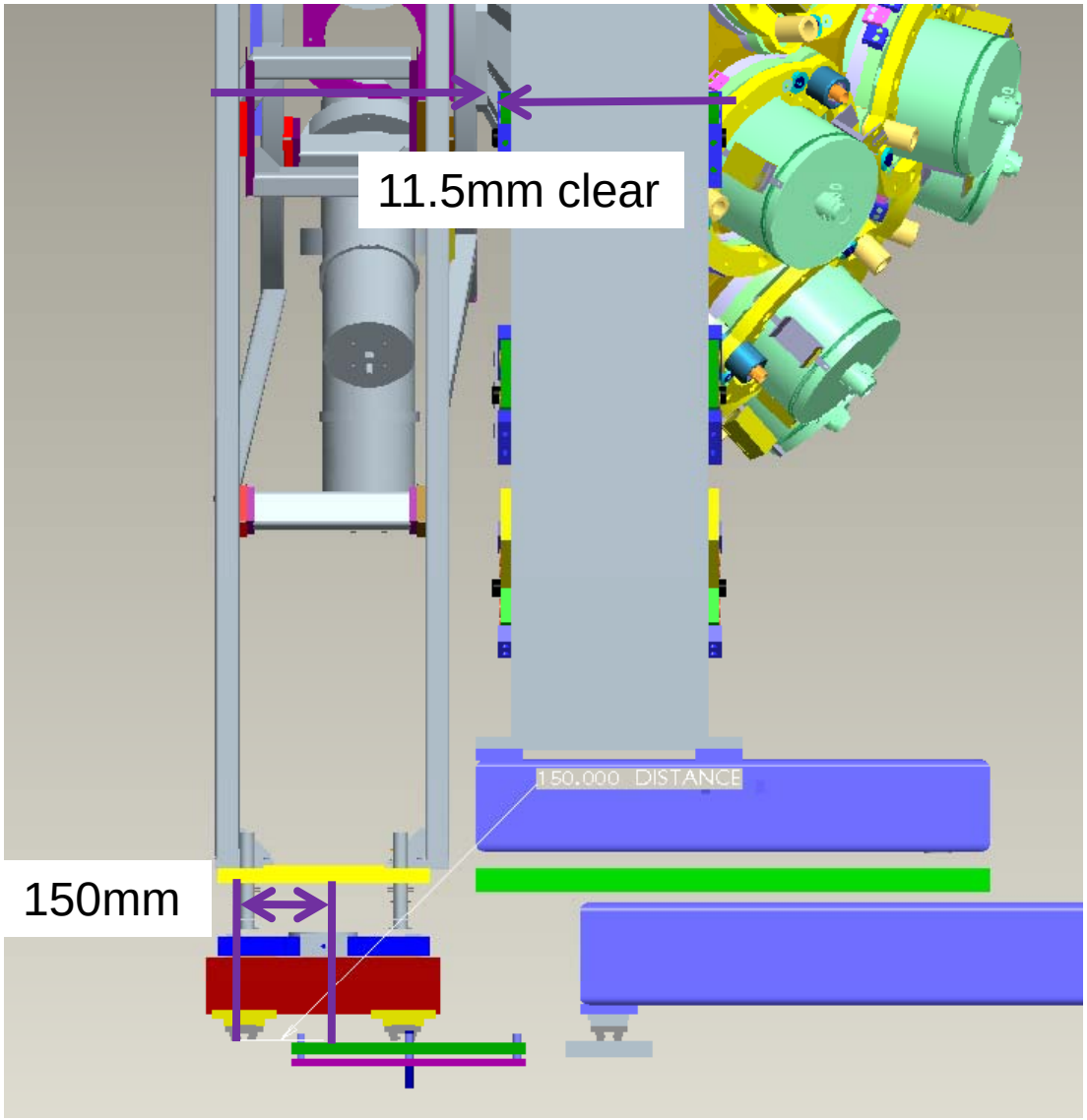
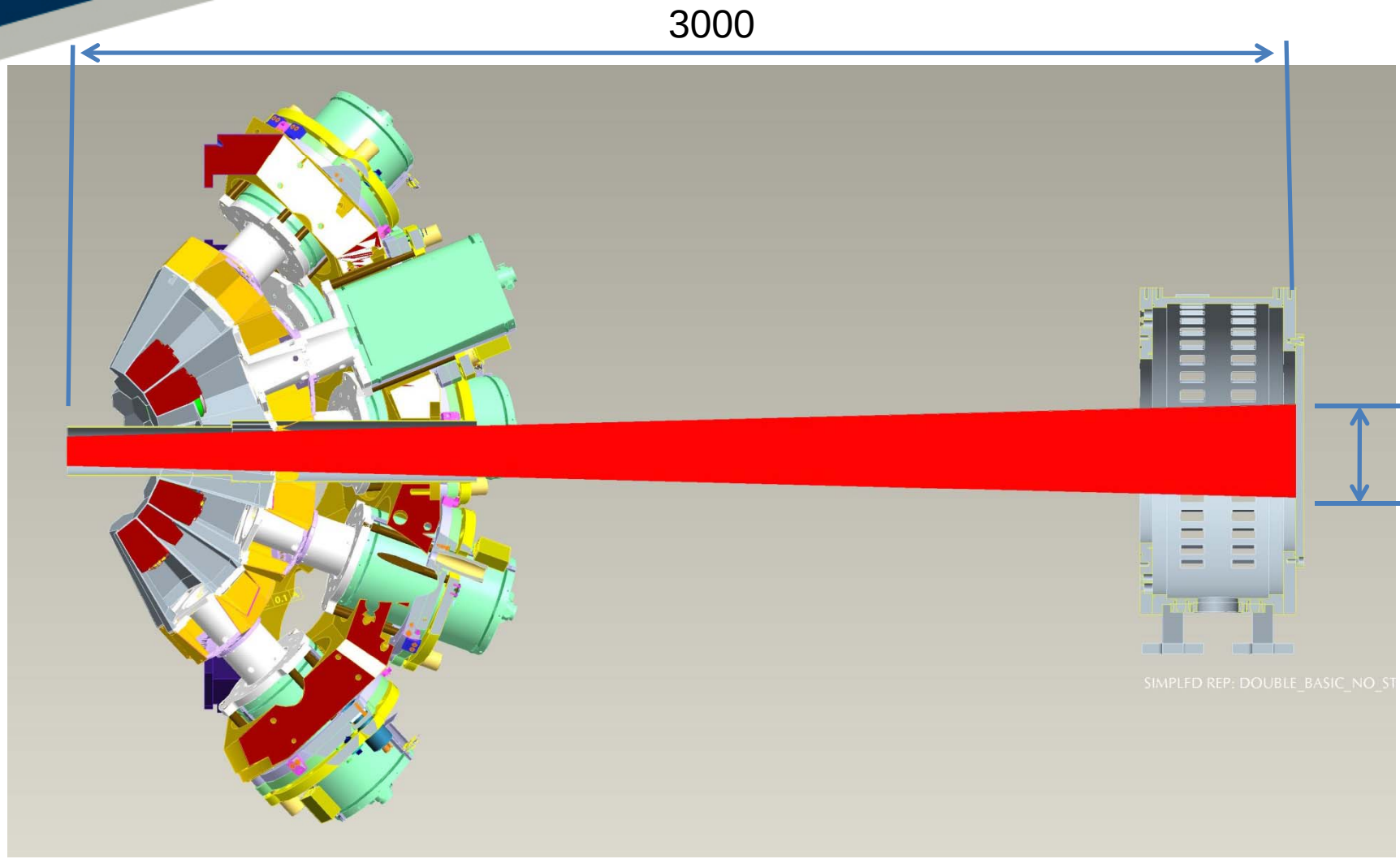
Miniball Stand



LYCCA Considerations



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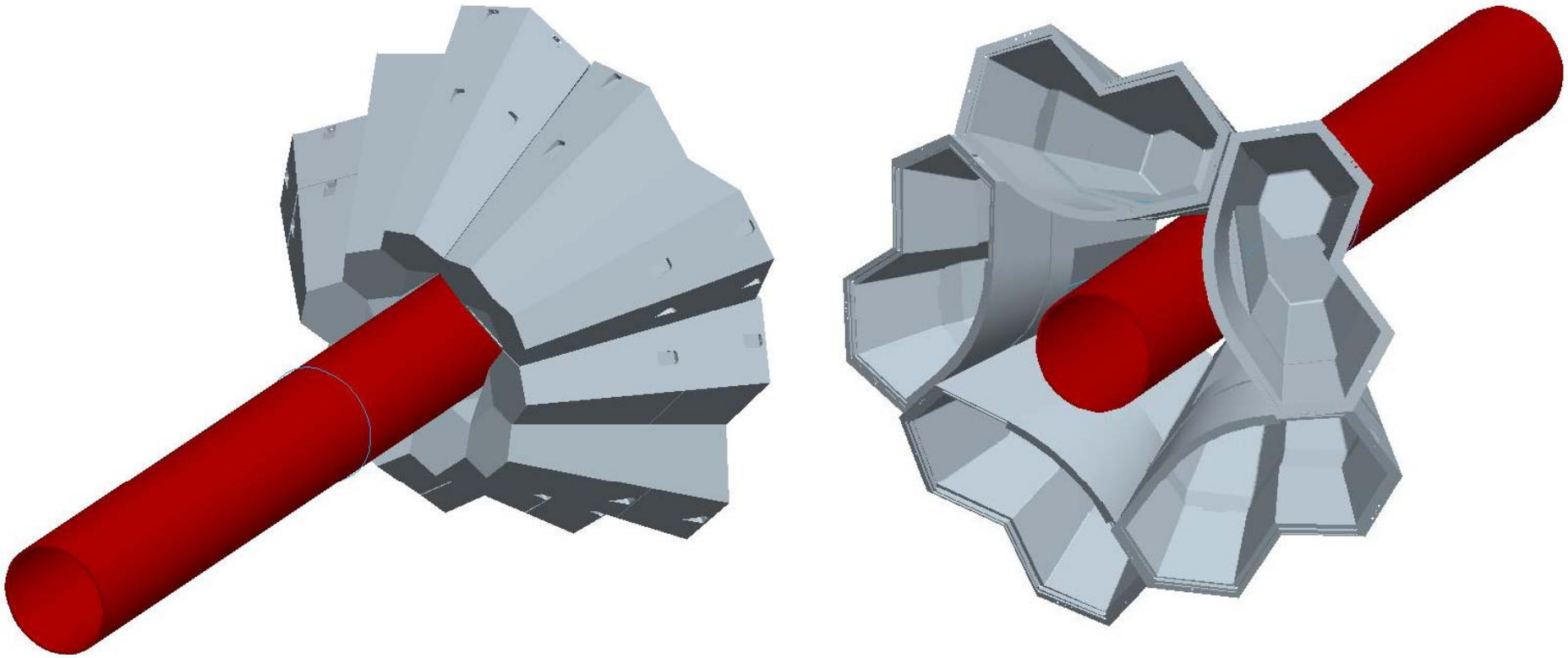
Agata Doubles

AGATA DOUBLE CRYOSTAT
PRELIMINARY DESIGN



5 DOUBLES AROUND 120 DIA BEAM PIPE

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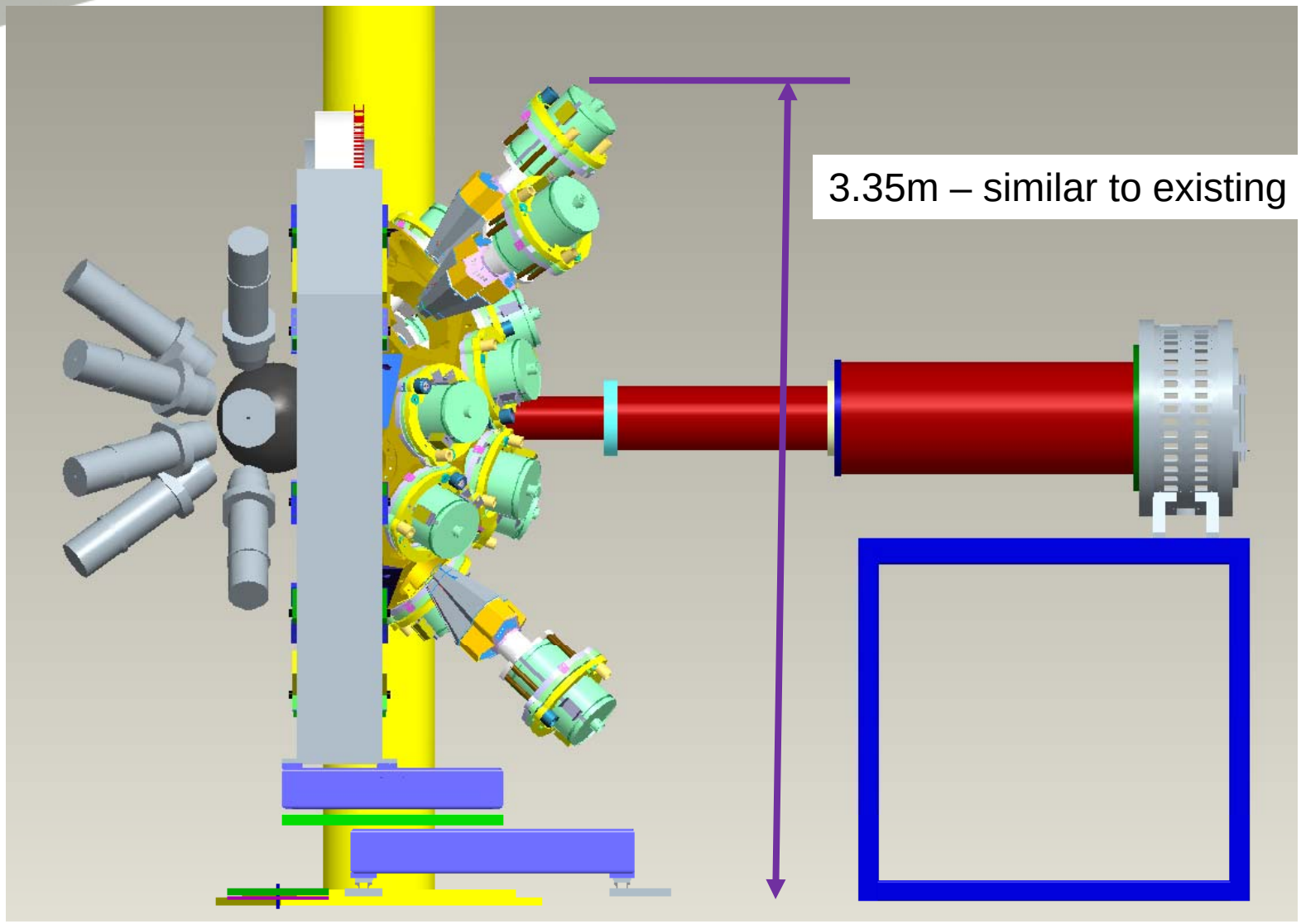
Loading/Unloading GSI



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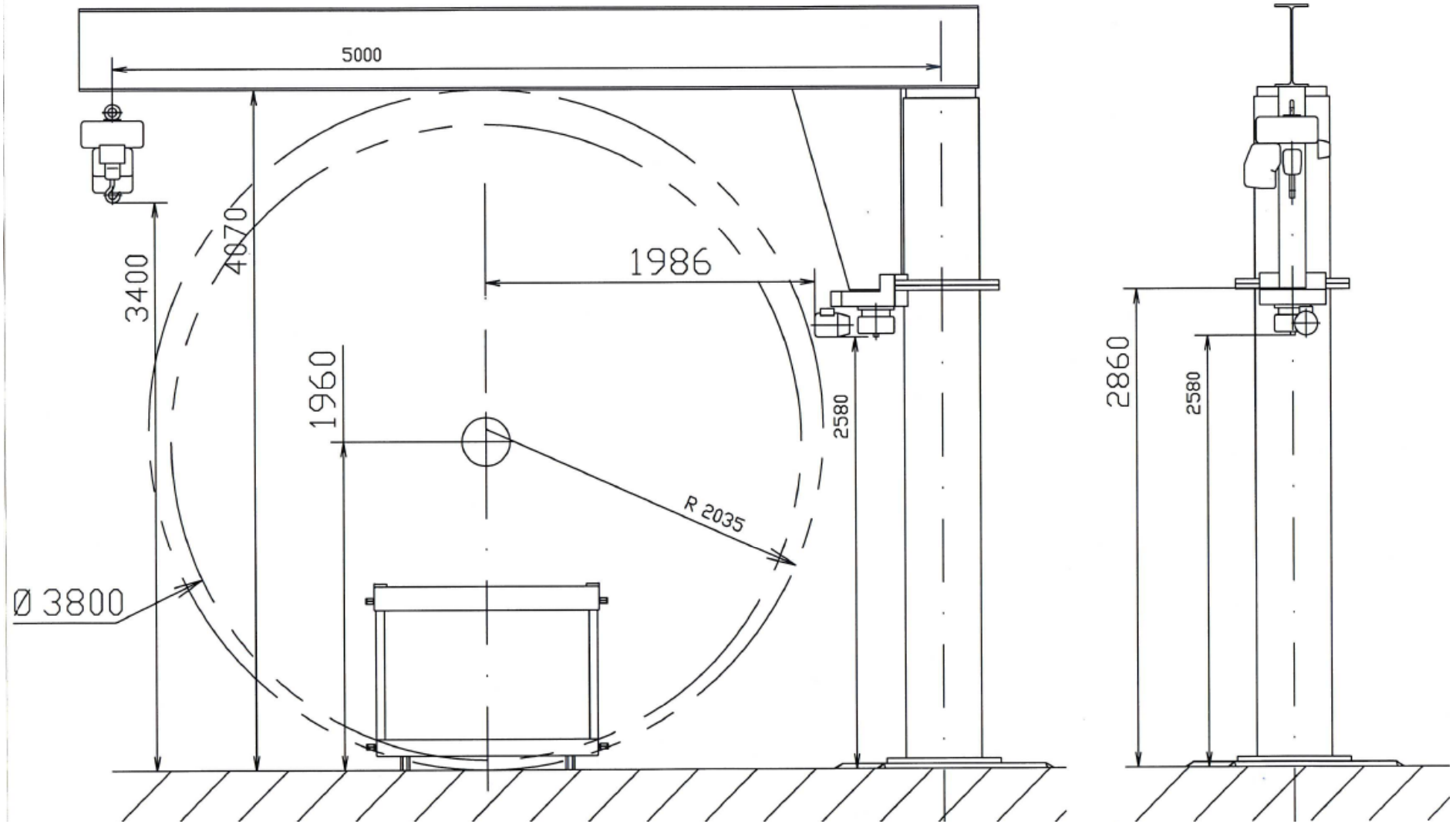
GSI Crane Height



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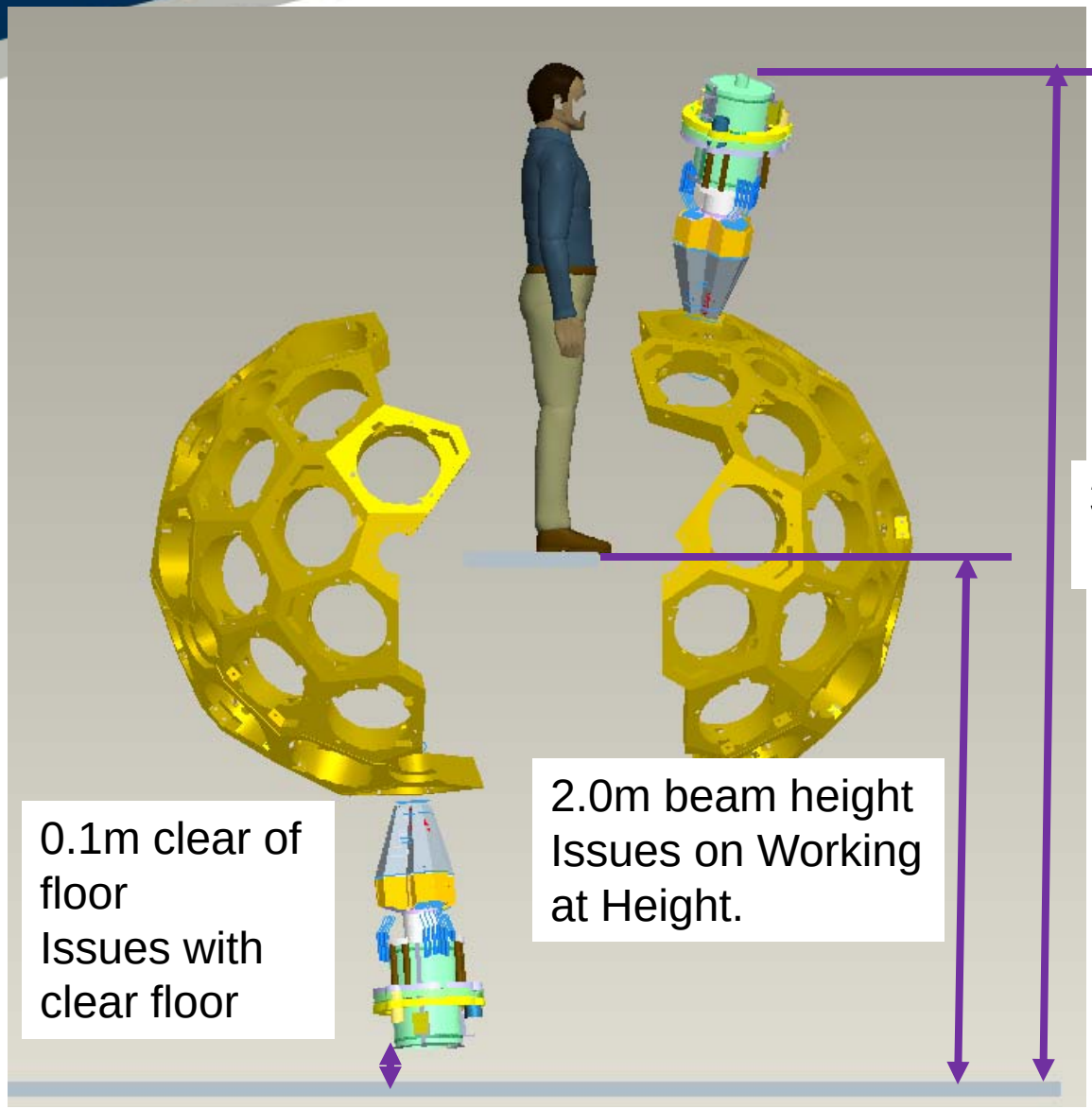
Access to Top and Base detectors in Fixed Array



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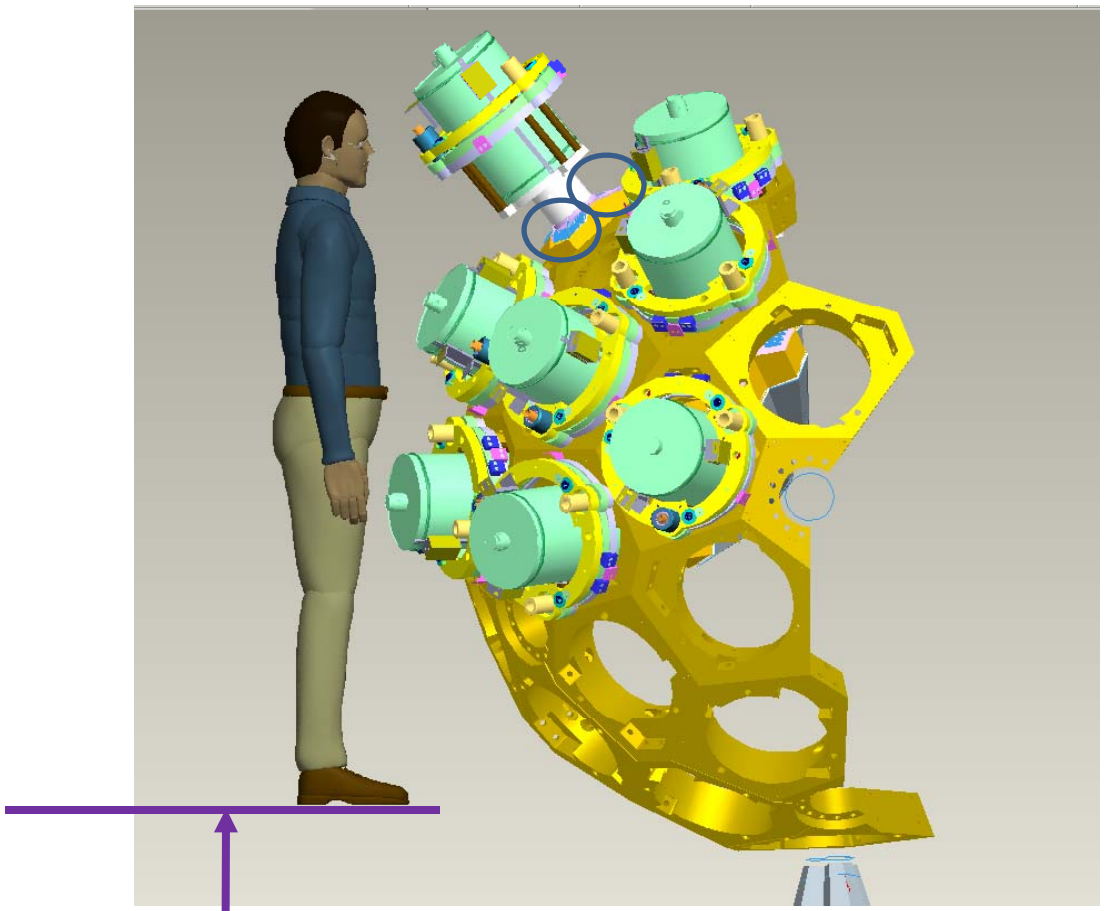
Access to Electrical connectors

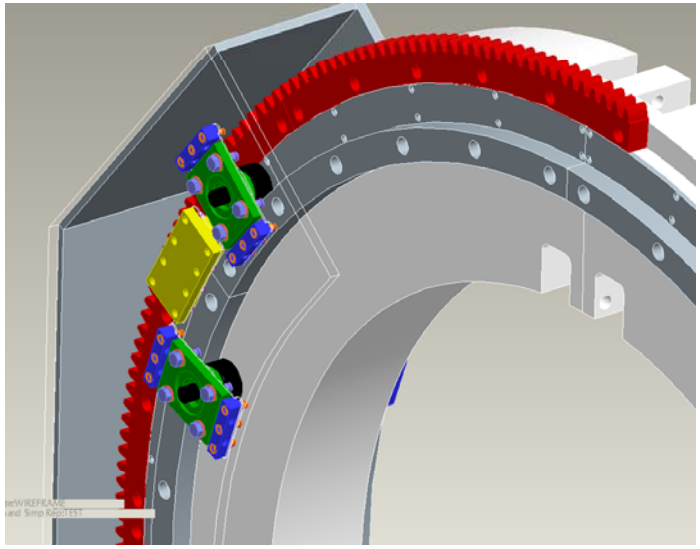


1.2m to floor

Loading

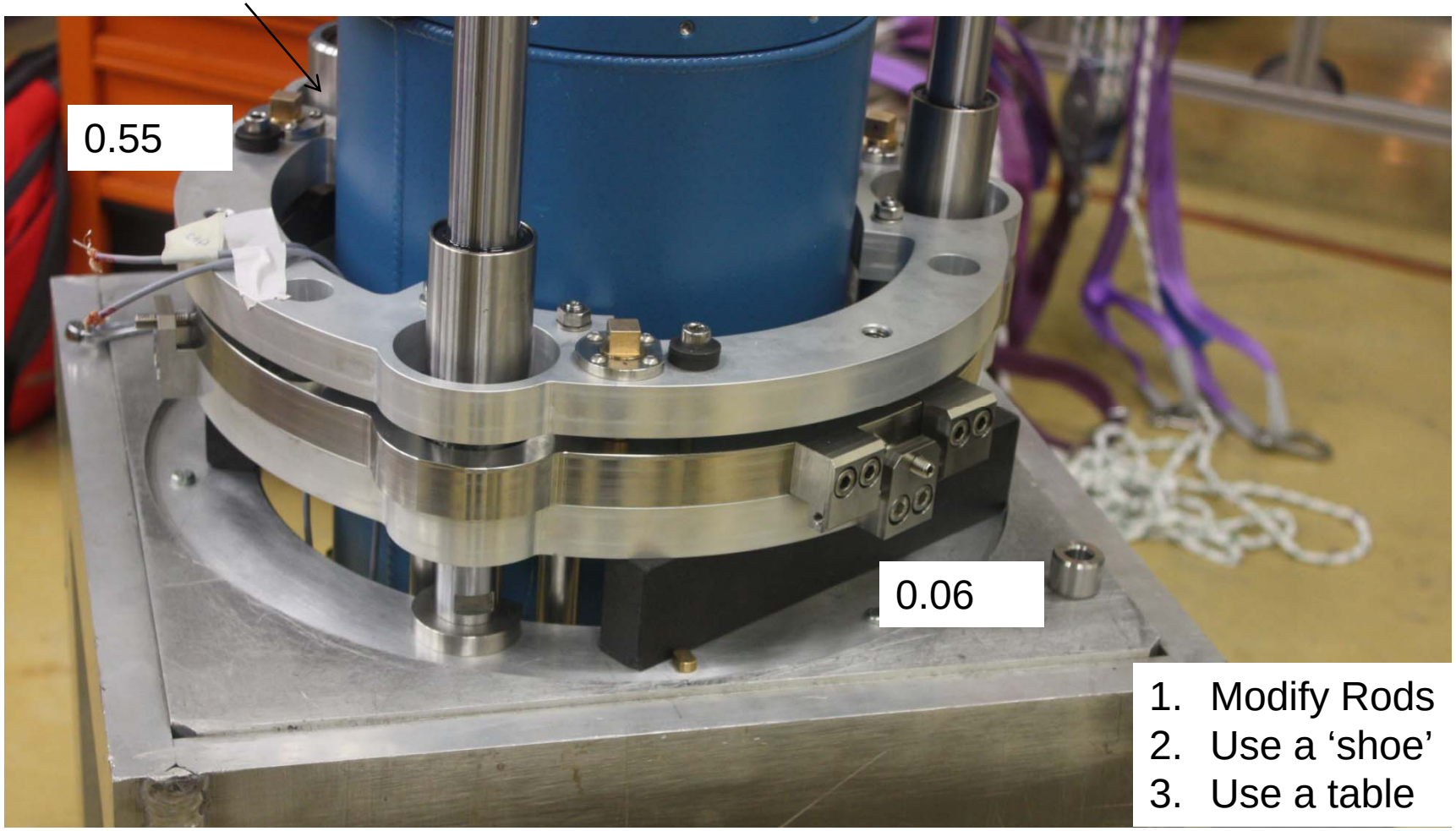
Conclusion:- Rotating Structure is required to ensure safe loading.
If not at GSI, then certainly at FAIR.

Due to – Working at heights.
Crane Heights
Proximity to floor of detector (at FAIR)



NOTE – Detectors can only be loaded when the two halves of the array are closed.

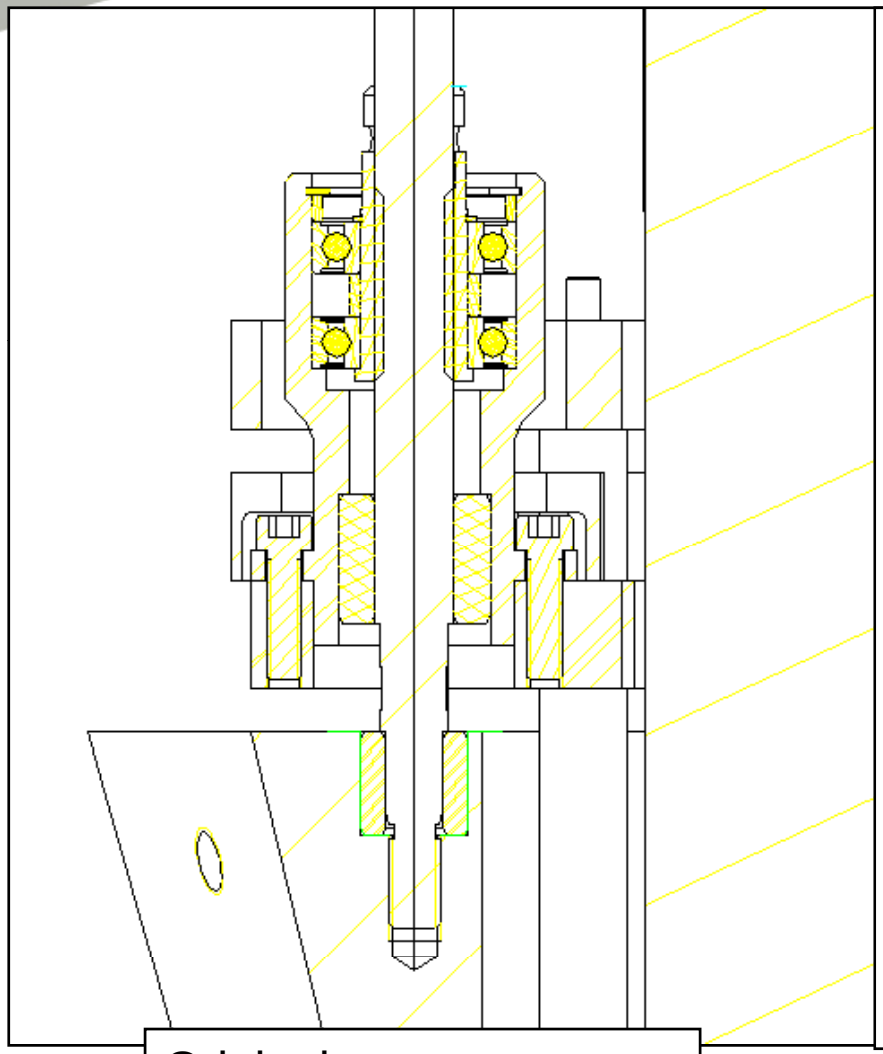
Deflection of detector during installation



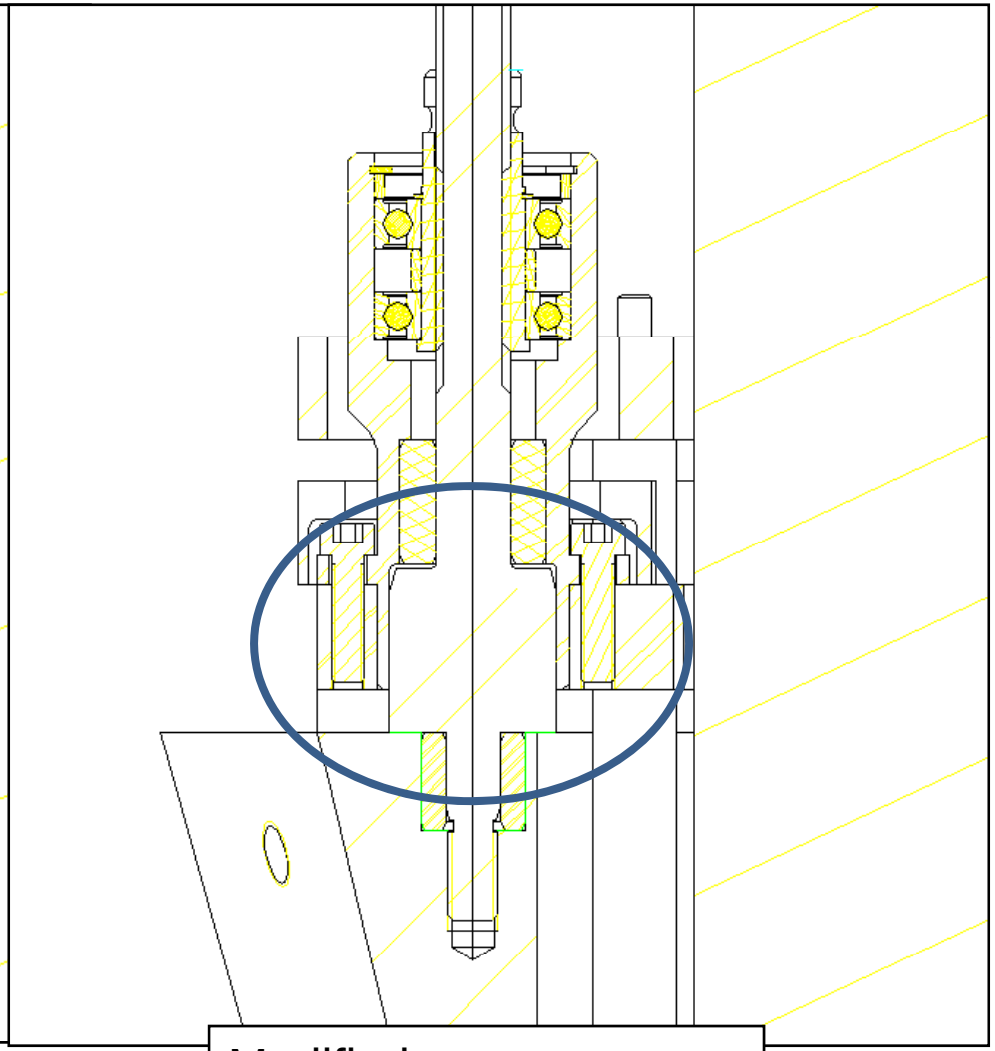
1. Modify Rods
2. Use a ‘shoe’
3. Use a table

Current Guide Rod

1. If went to a single ring, machined to suit would be able to use a longer spigot.



Original



Modified

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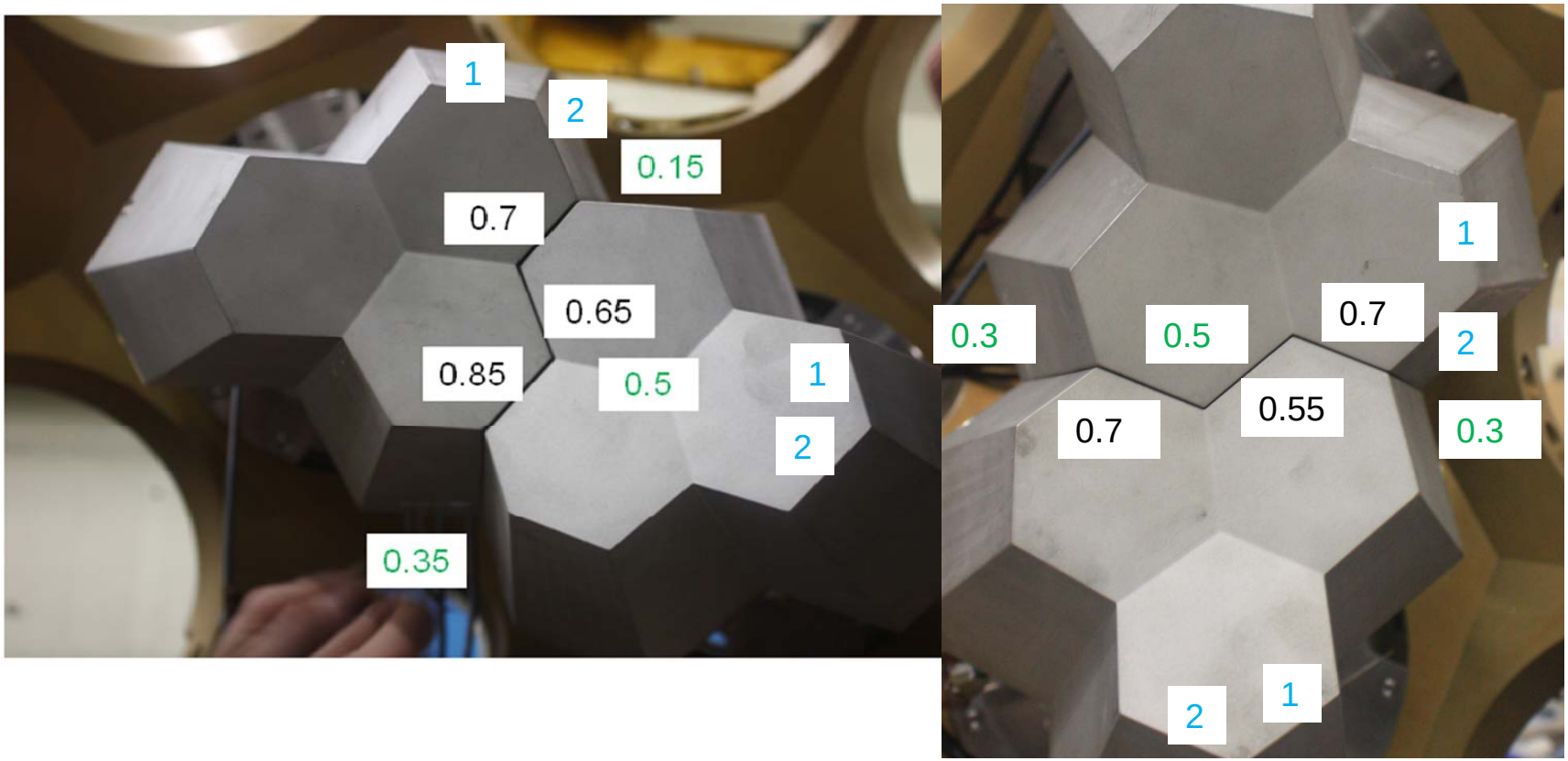
Measured values

2. Use of a soft plastic ‘shoe ‘ in the space between the detectors. Say 0.25mm thick.



3. A rotating structure also allows for the development of a loading platform that could be used so that the detector weight does not deflect the threaded rods

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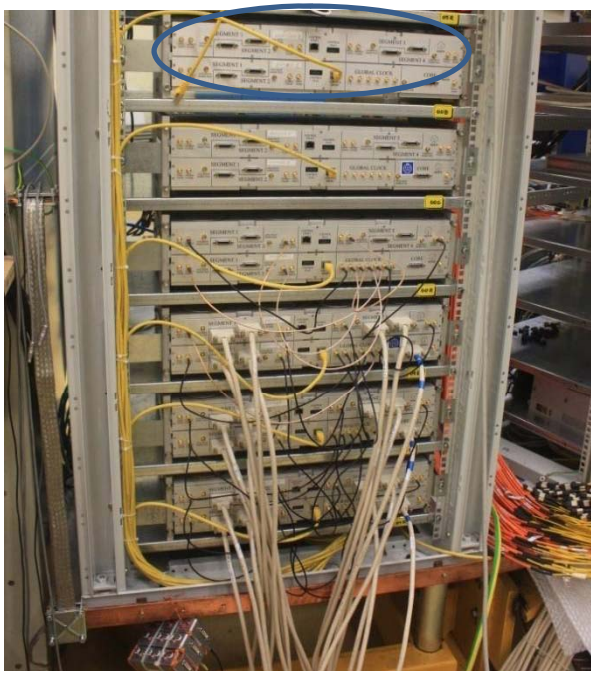
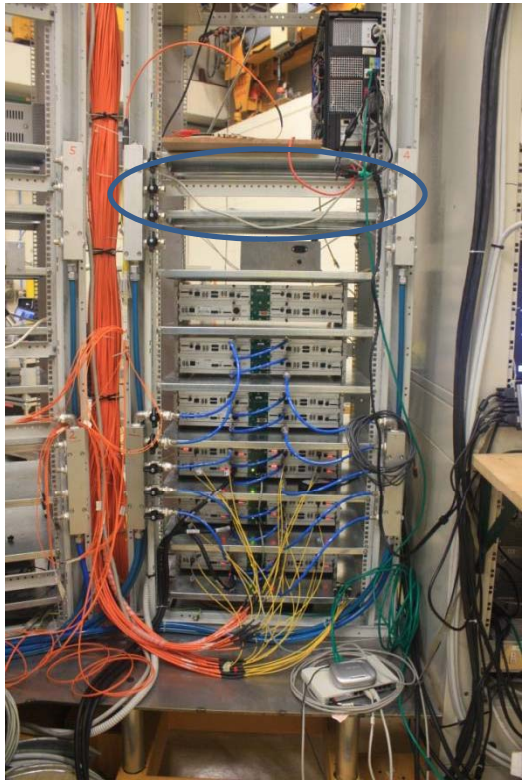
Digitisers





1 digitiser unit per crystal.
30 crystals required.
Digitisers installed at 160mm pitch.

Say 15 crystals per side.
Single rack 2.4m + plinth.
Or two racks

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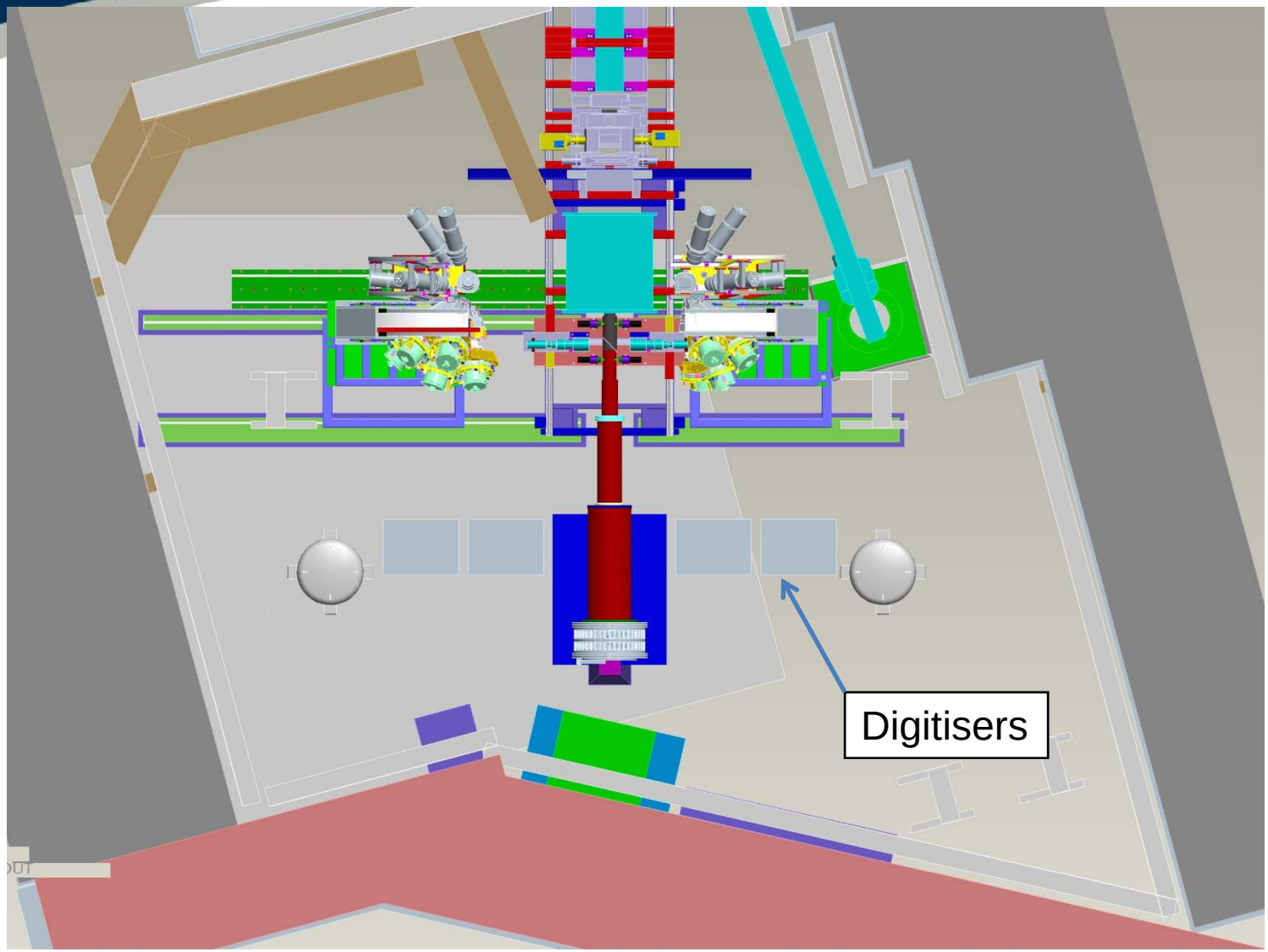
Digitiser Location?



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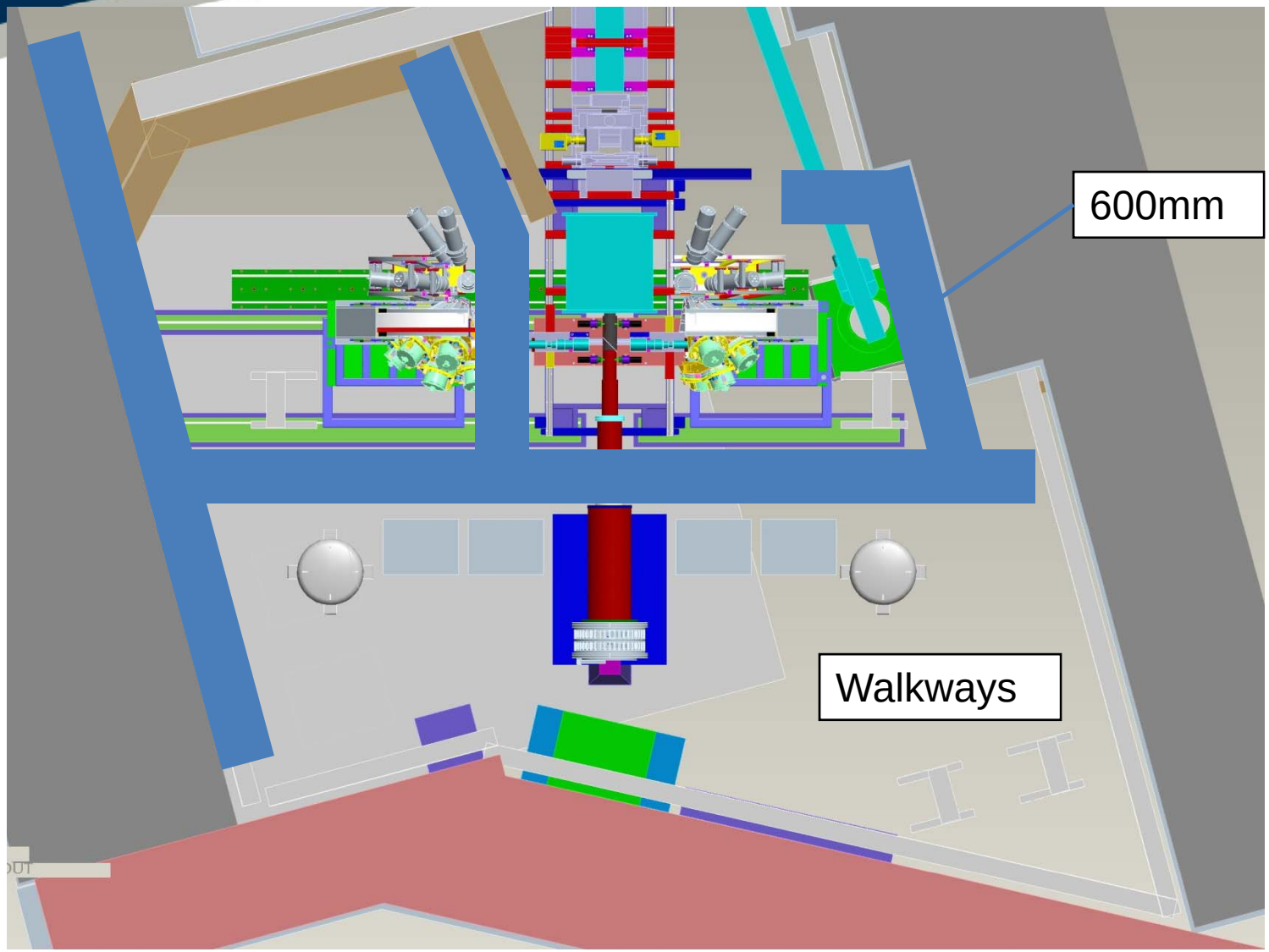
Access Routes



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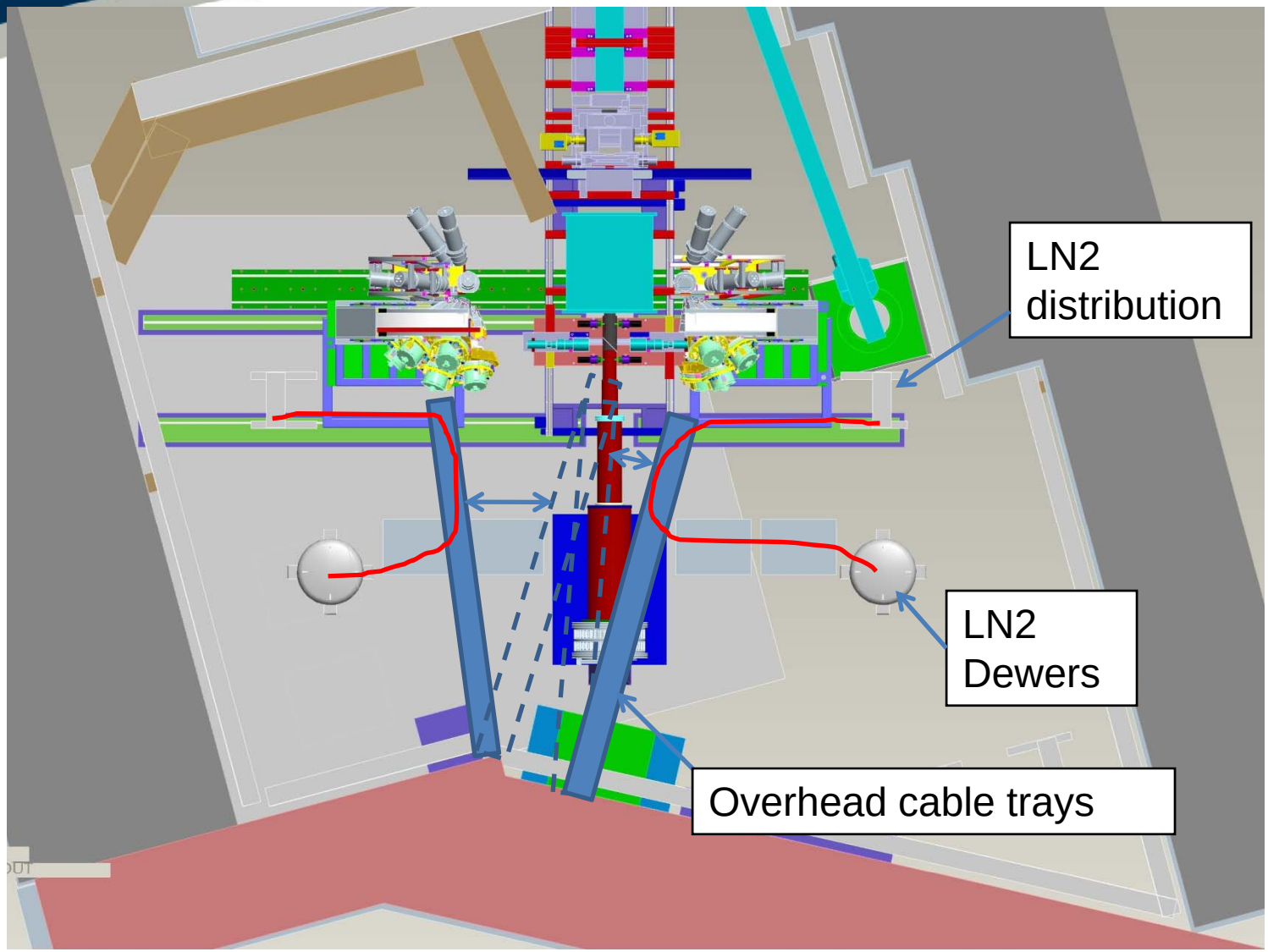
LN2 distribution



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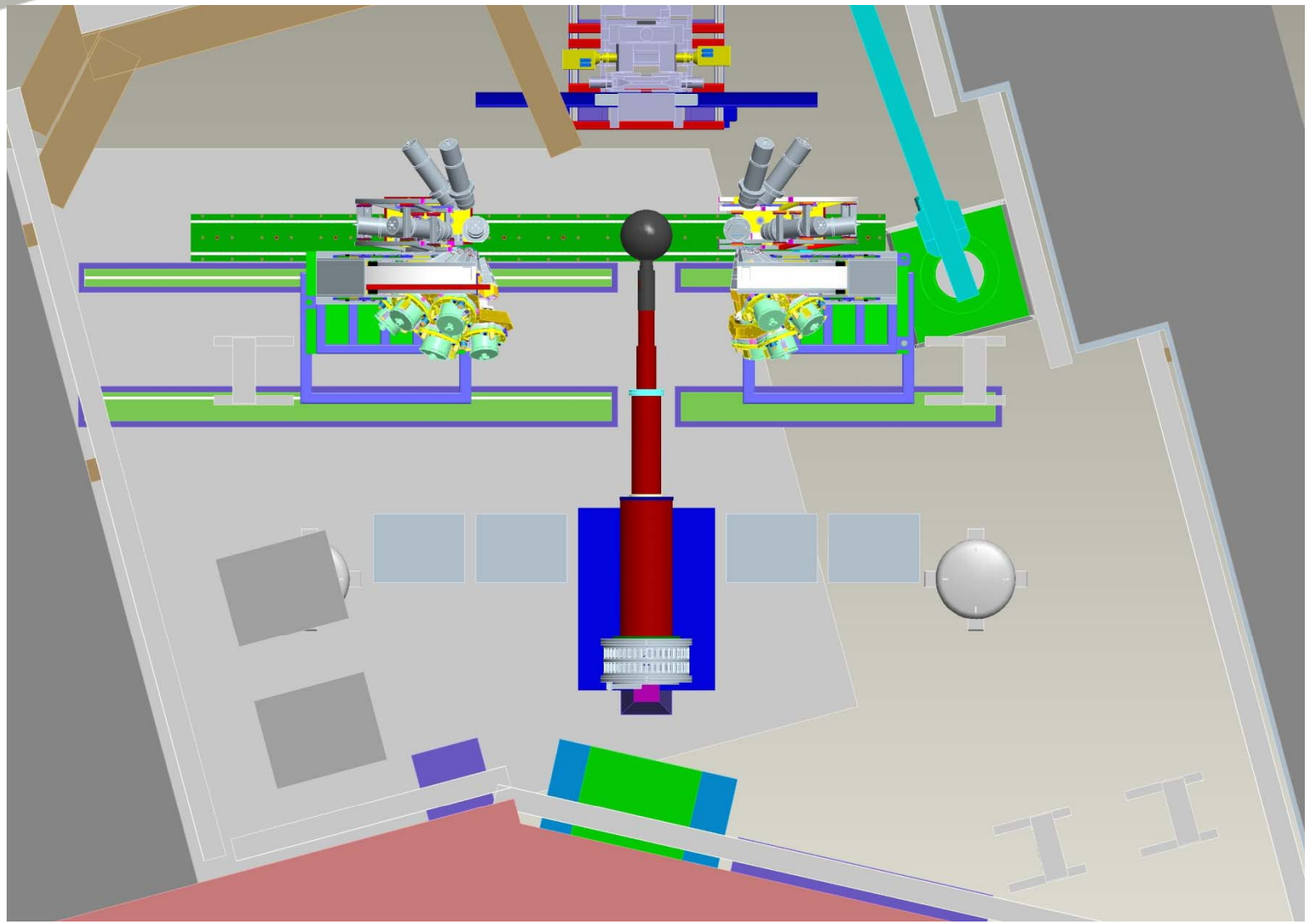
Target area ball open



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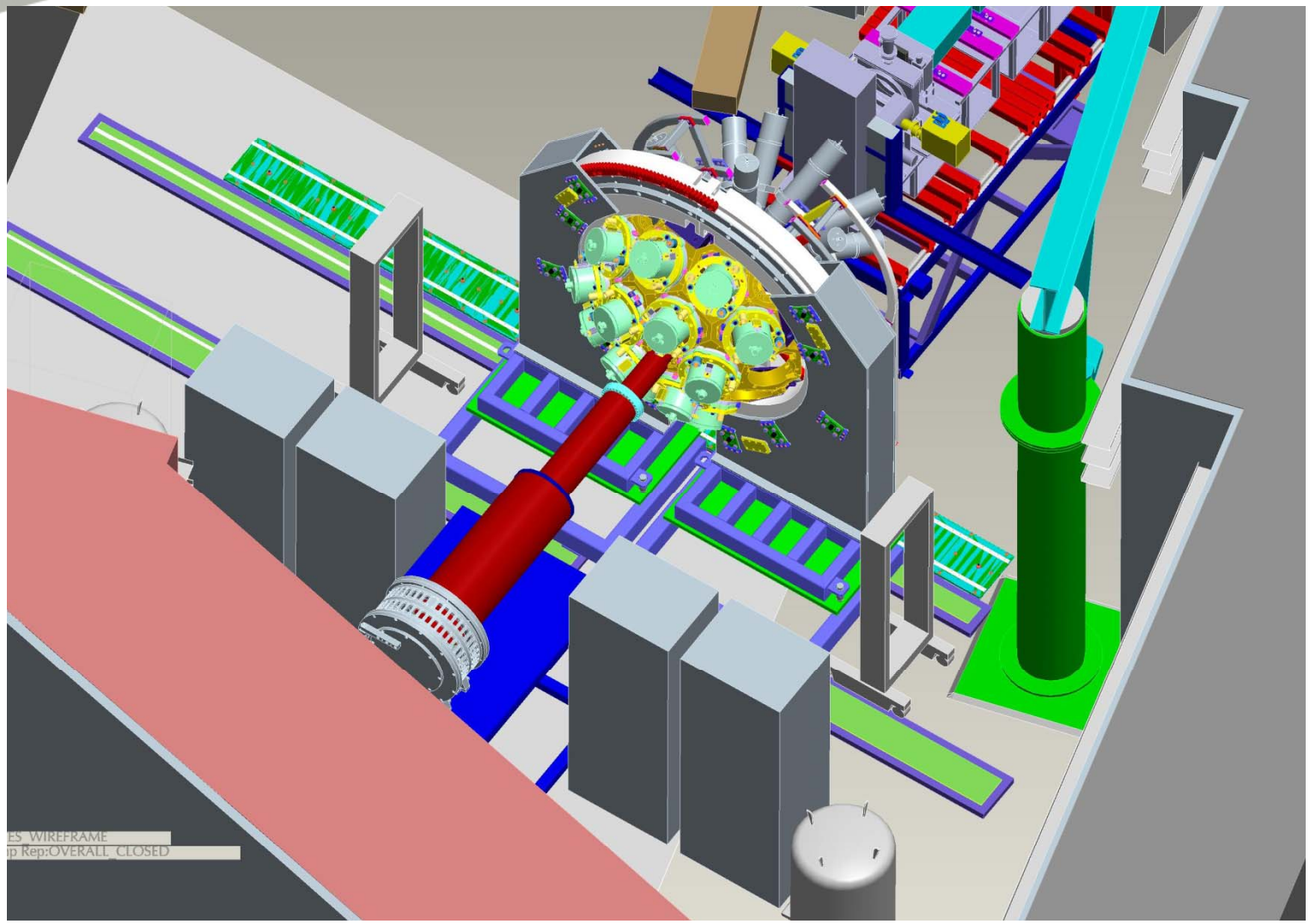

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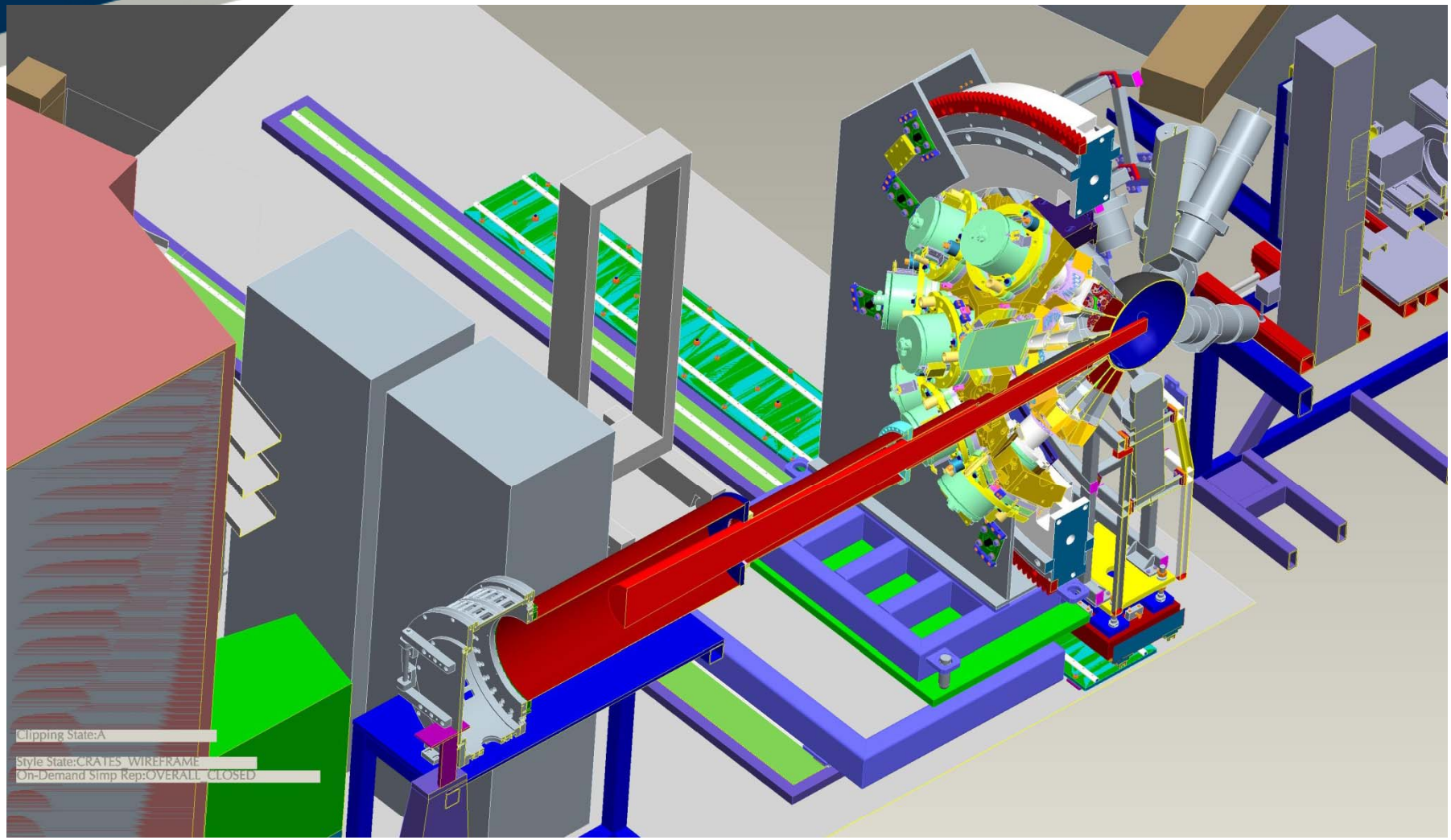
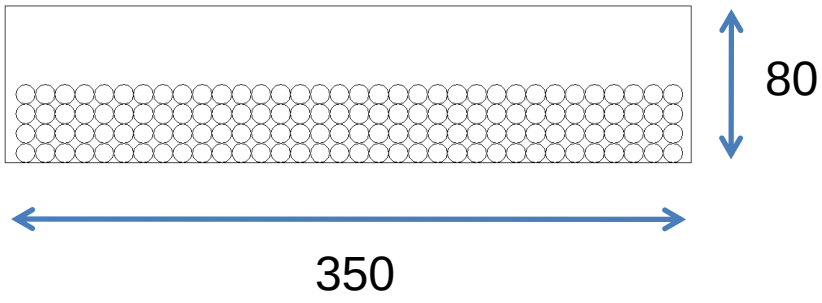


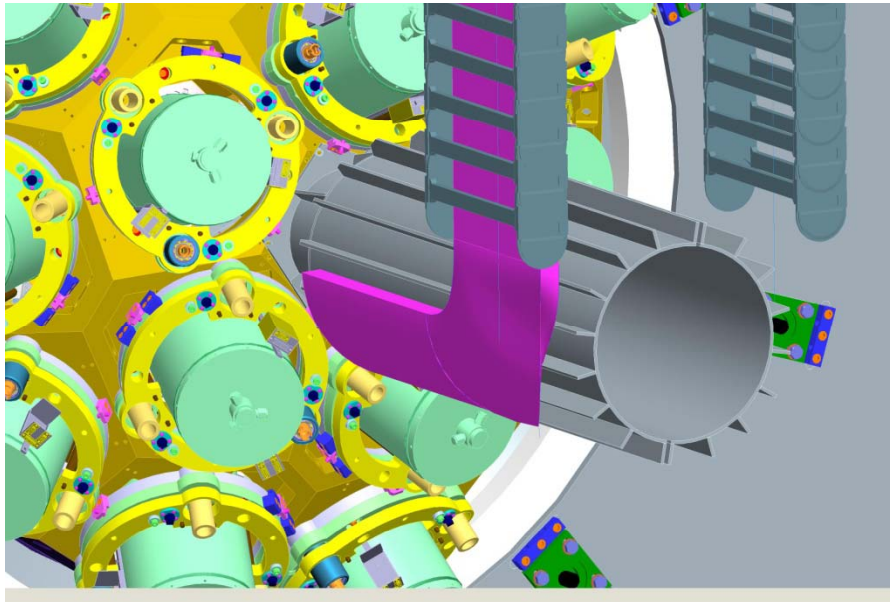
Cable routing

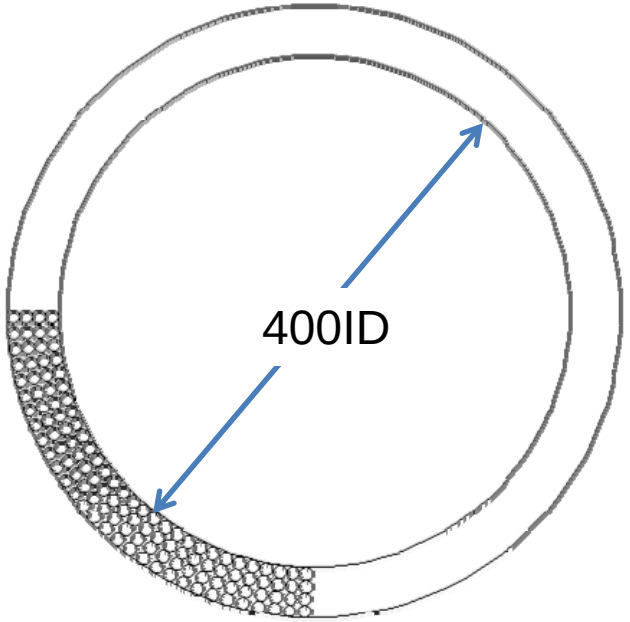


IGUS Series E4.80 can be used

Allow for 30 crystals
7 cables per crystal
This is 210 cables
approx 105 cables per side.
Allow 128 cables for safety

Cables are 10mm diameter





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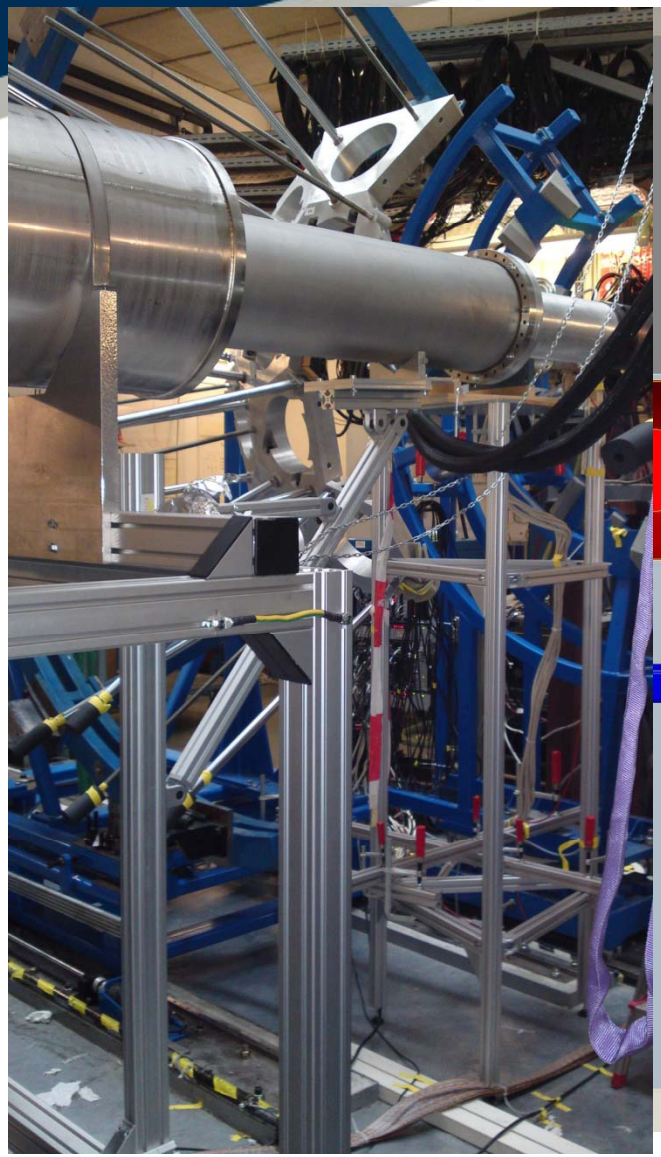
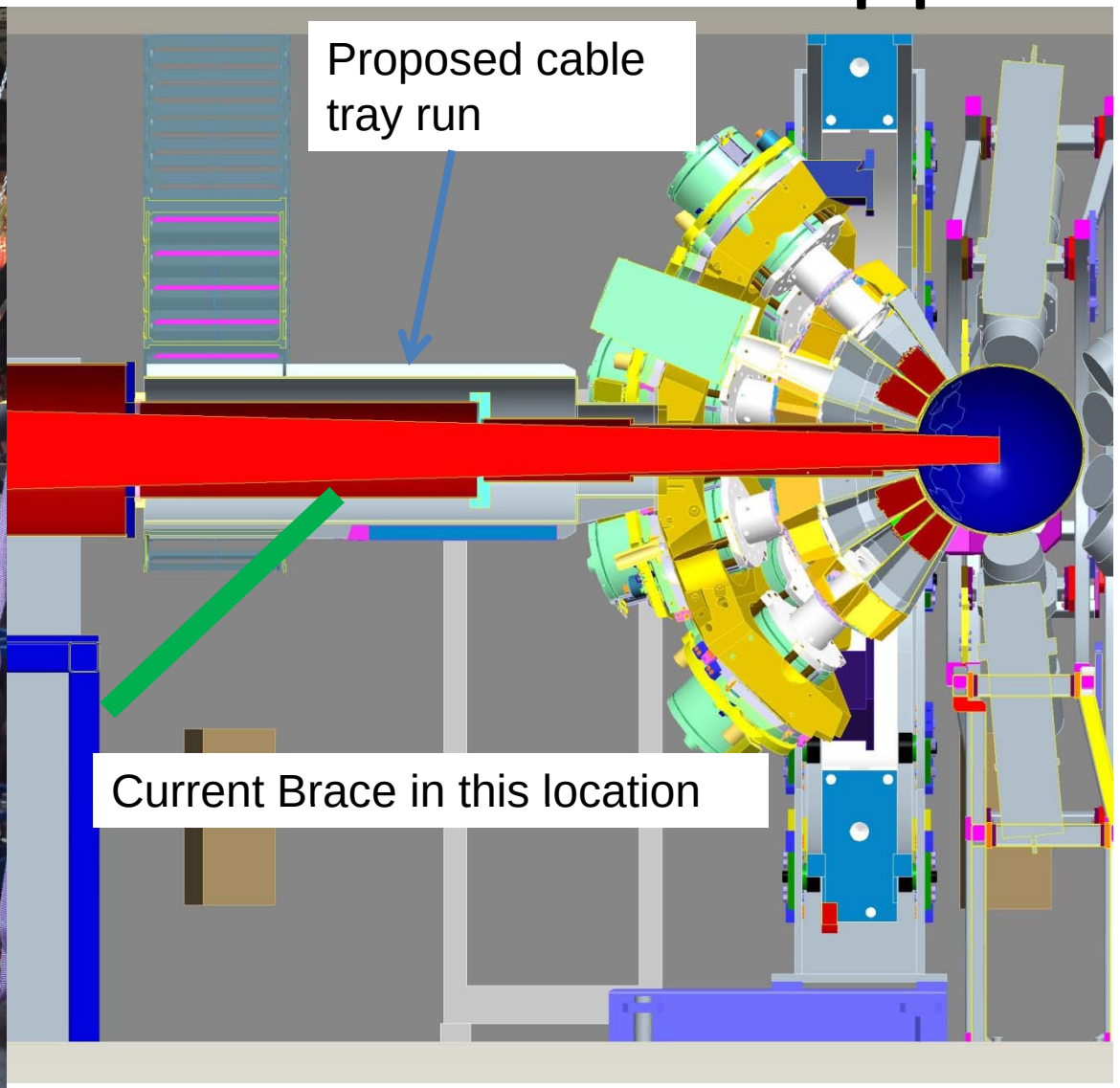
LYCCA Beamline support





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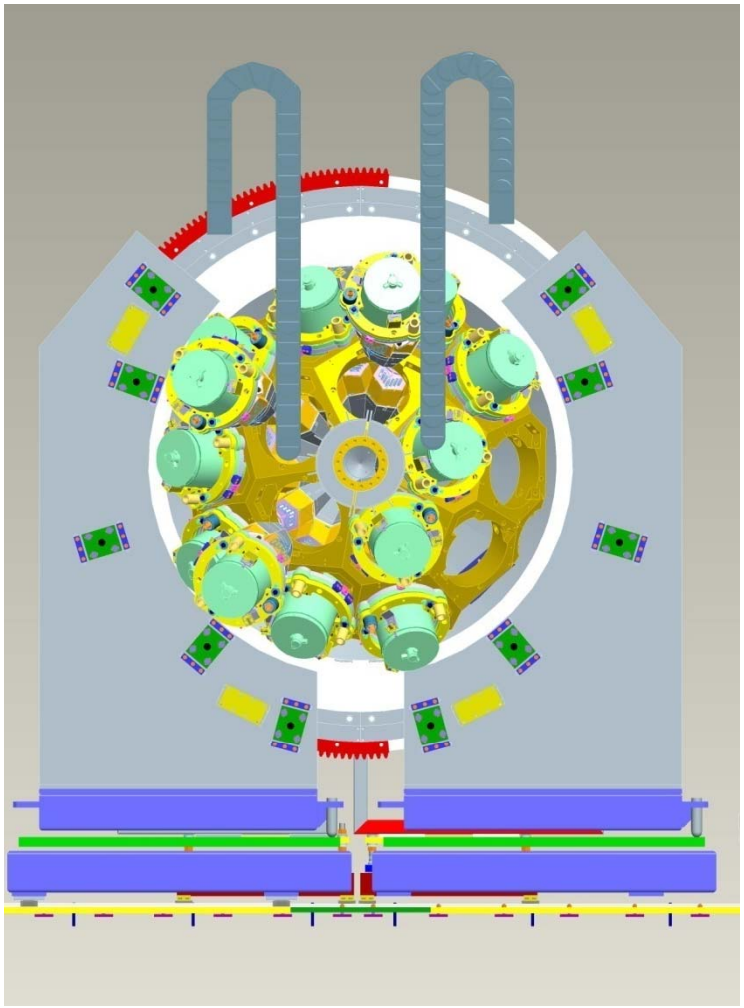
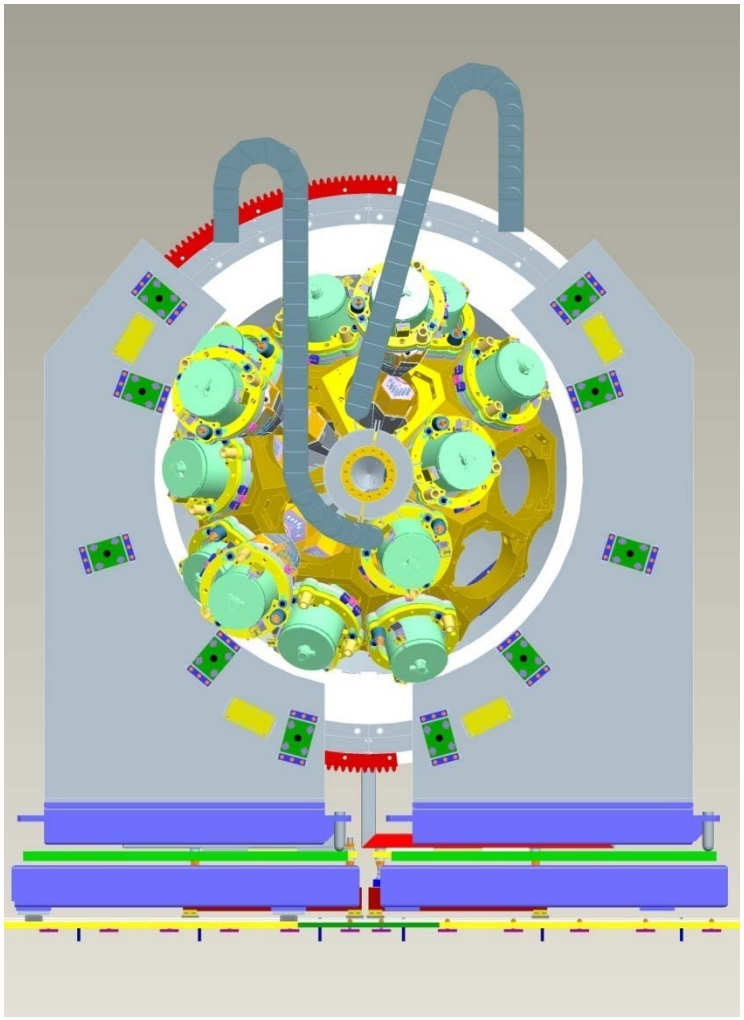
Cable coiler operation





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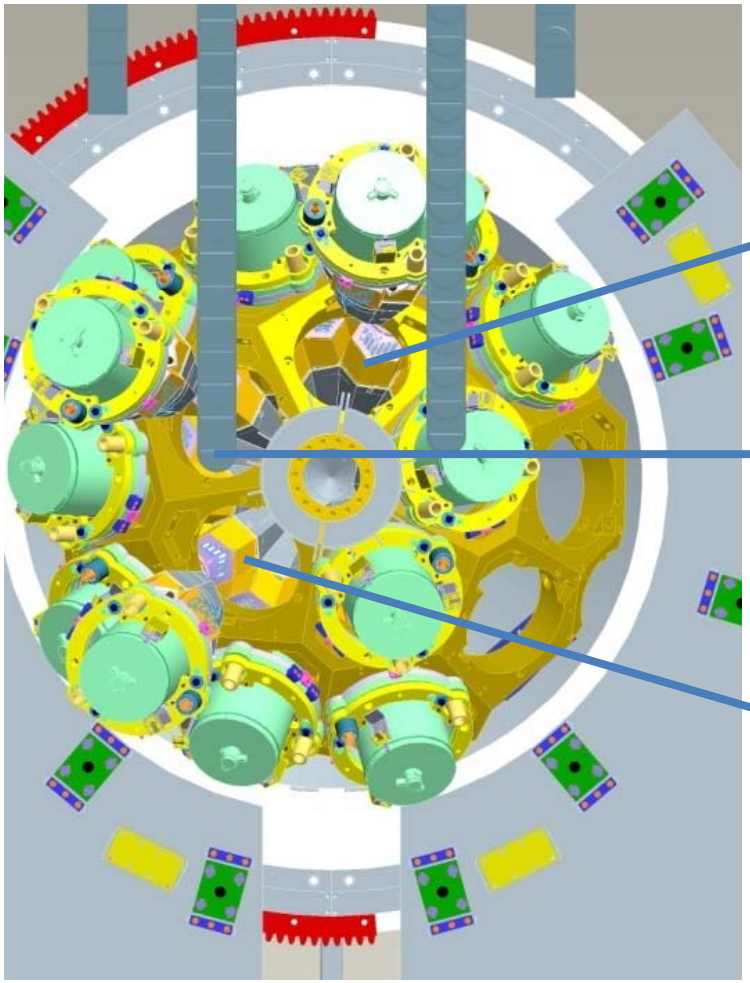
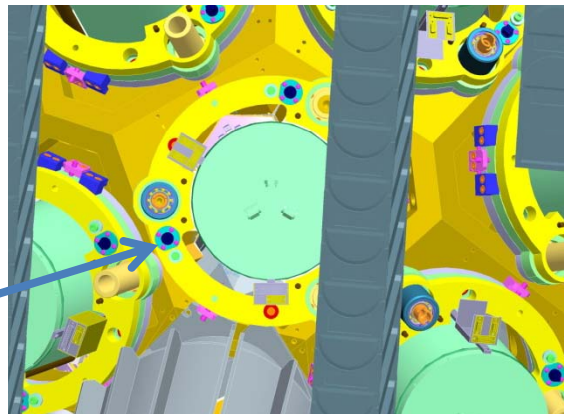
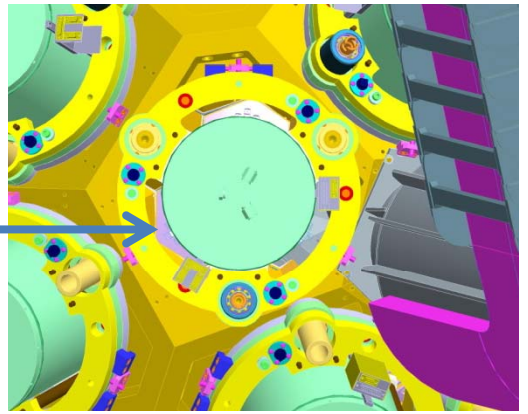
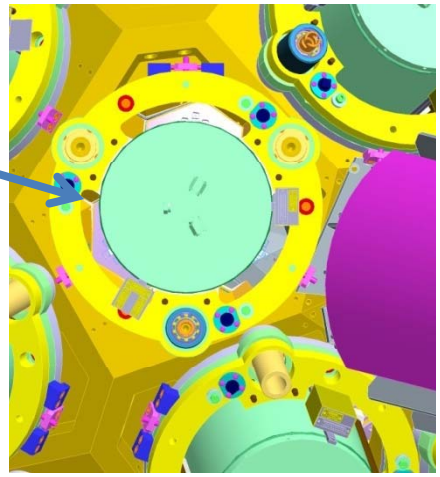
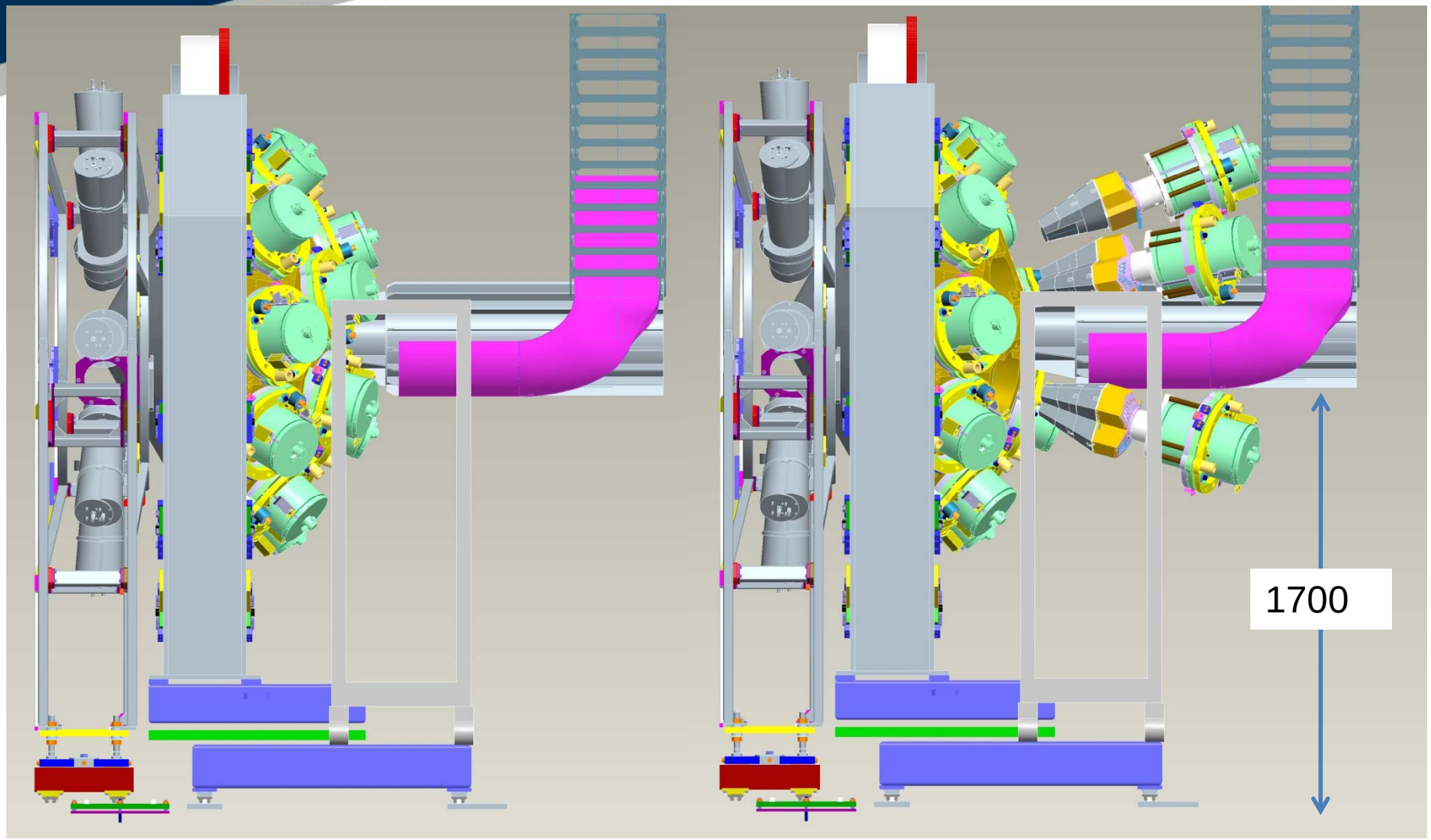
End on view of Detectors











Detectors retracted 850mm

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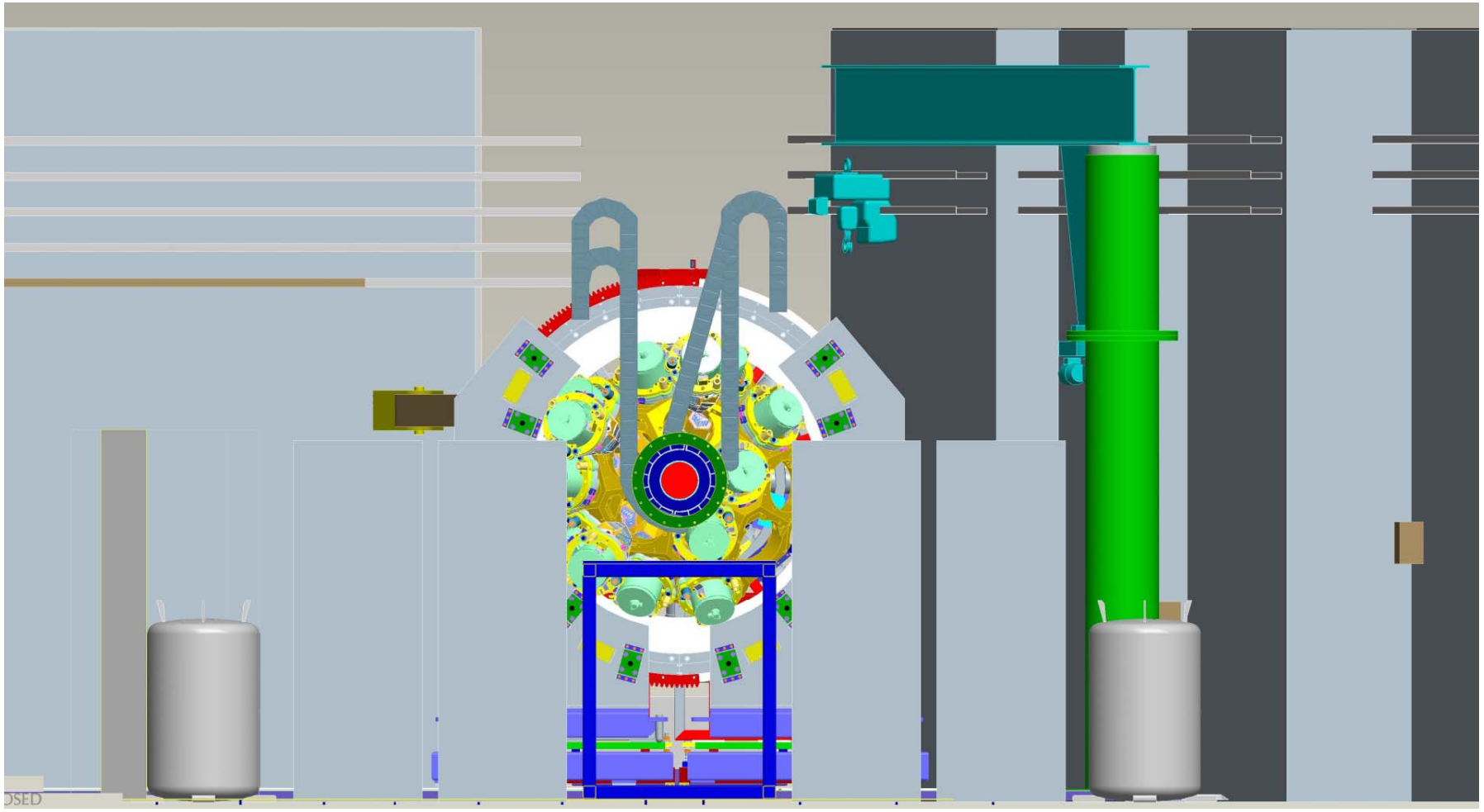
Front Elevation



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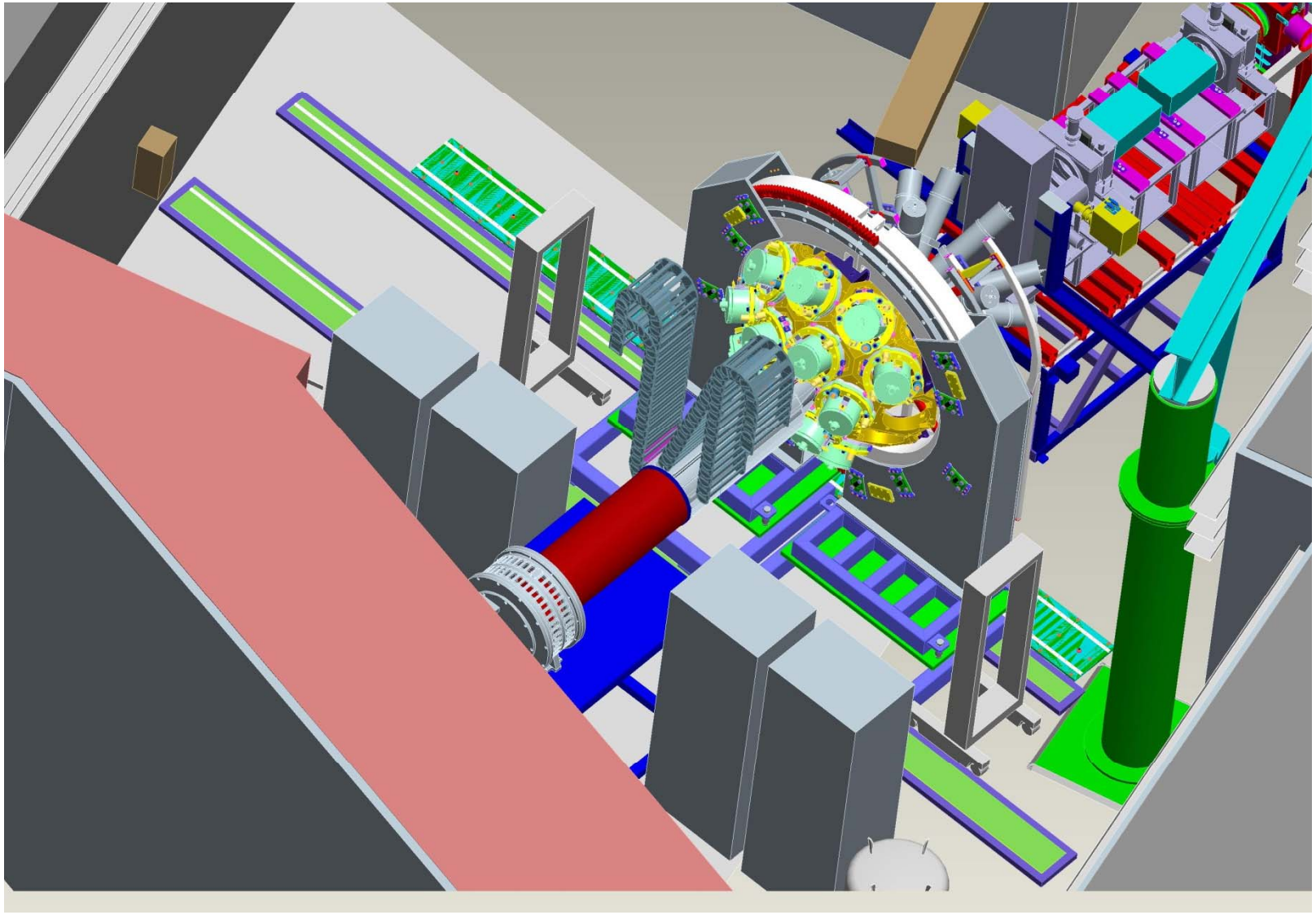

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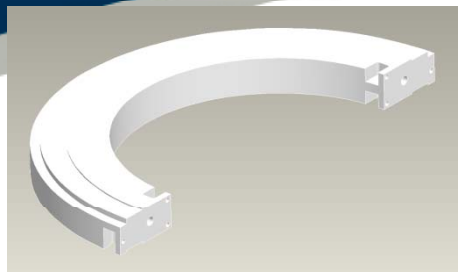
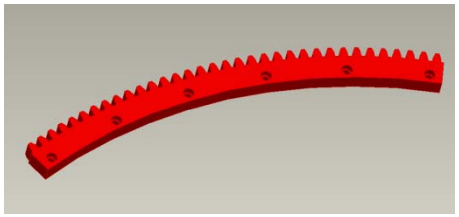
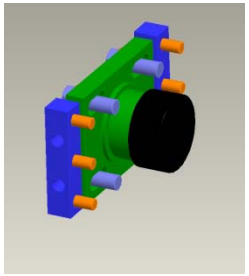
Cost Estimates



Main Ring 2.5m OD 200mm thick M/C from Solid
Material cost: £1906 ea.
Machining cost: £1502 ea.
Budget for 2 off = £10k (8k)



Gear segment
Machining cost: £800 ea
Budget for 8 off = £7.5k



Roller Units
Roller cost: £70 ea.
Machining cost: £50 ea. (Liverpool)
Budget for 24 off = £5k

Motor, Gearbox, Encoder and Control System
Budget for 1 off = £5k

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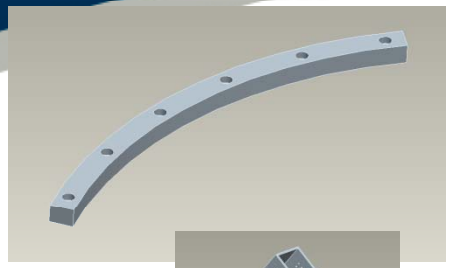
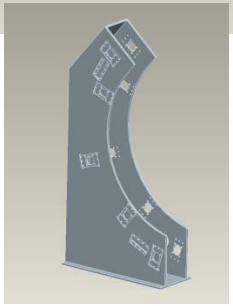
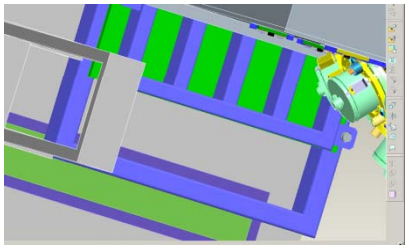
Cost Estimates







Rail Segments
Machining cost: £200 ea.
Budget for 6 off = £2k (Liverpool)

Main Ring Support Structure
Machining cost: £10k ea
Budget for 2 off = £20k

Supporting adjustment frames
Budget for 4 off = £10k

Adapter blocks = £2.5k (Liverpool)

Detector removal structure = £8k

Total = £70k

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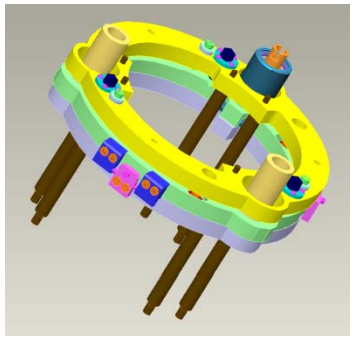
Cost Estimates



In addition 5 sets of rings will be made by Liverpool University

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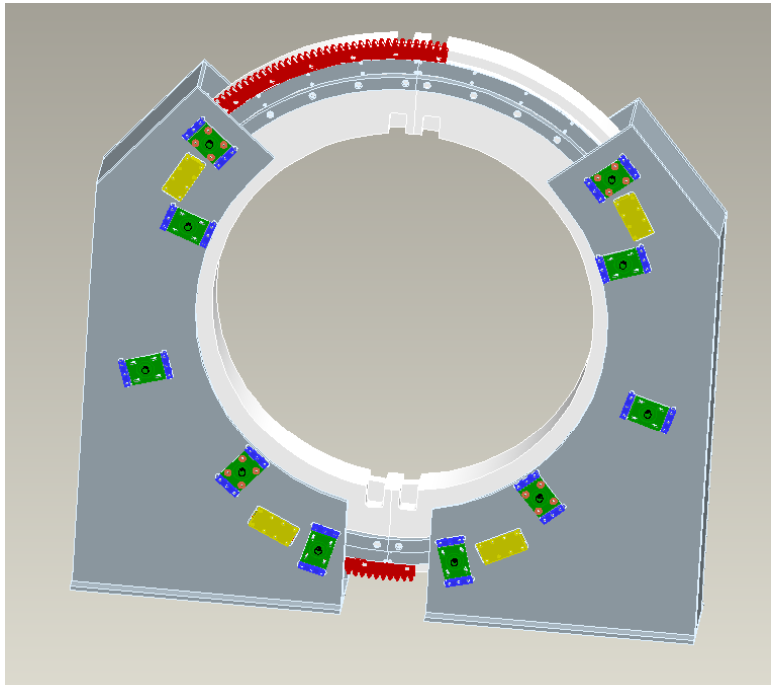
ID	Task Name	Duration	Start	Finish
3	**AGATA/PreSpec at GSI**	**309 days**	**Fri 09/07/10**	**Wed 14/09/11**
4	Design of AGATA plus LYCCA for PreSpec	167 days	Fri 09/07/10	Mon 28/02/11
5	Manufacture of fast beam PreSpec set-up AGATA plus LYCCA	5.5 mons	Mon 03/01/11	Mon 20/06/11
6	Test assembly of rotating section only.	1 mon	Mon 16/05/11	Tue 14/06/11
7	Shipping of parts of GSI	1 mon	Wed 15/06/11	Thu 14/07/11
8	Installation of AGATA plus LYCCA for fast beam PreSpec	2 mons	Fri 15/07/11	Wed 14/09/11



Discussion

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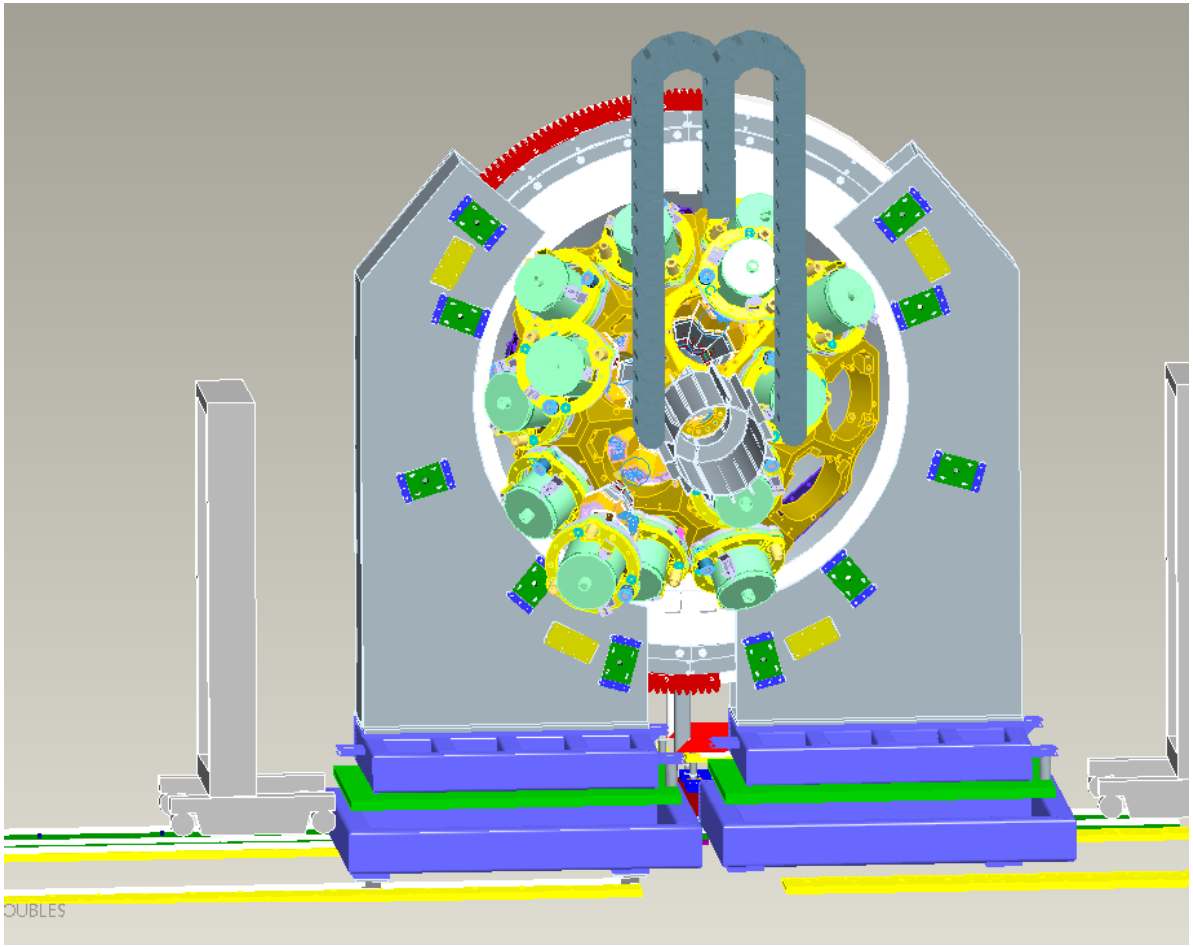

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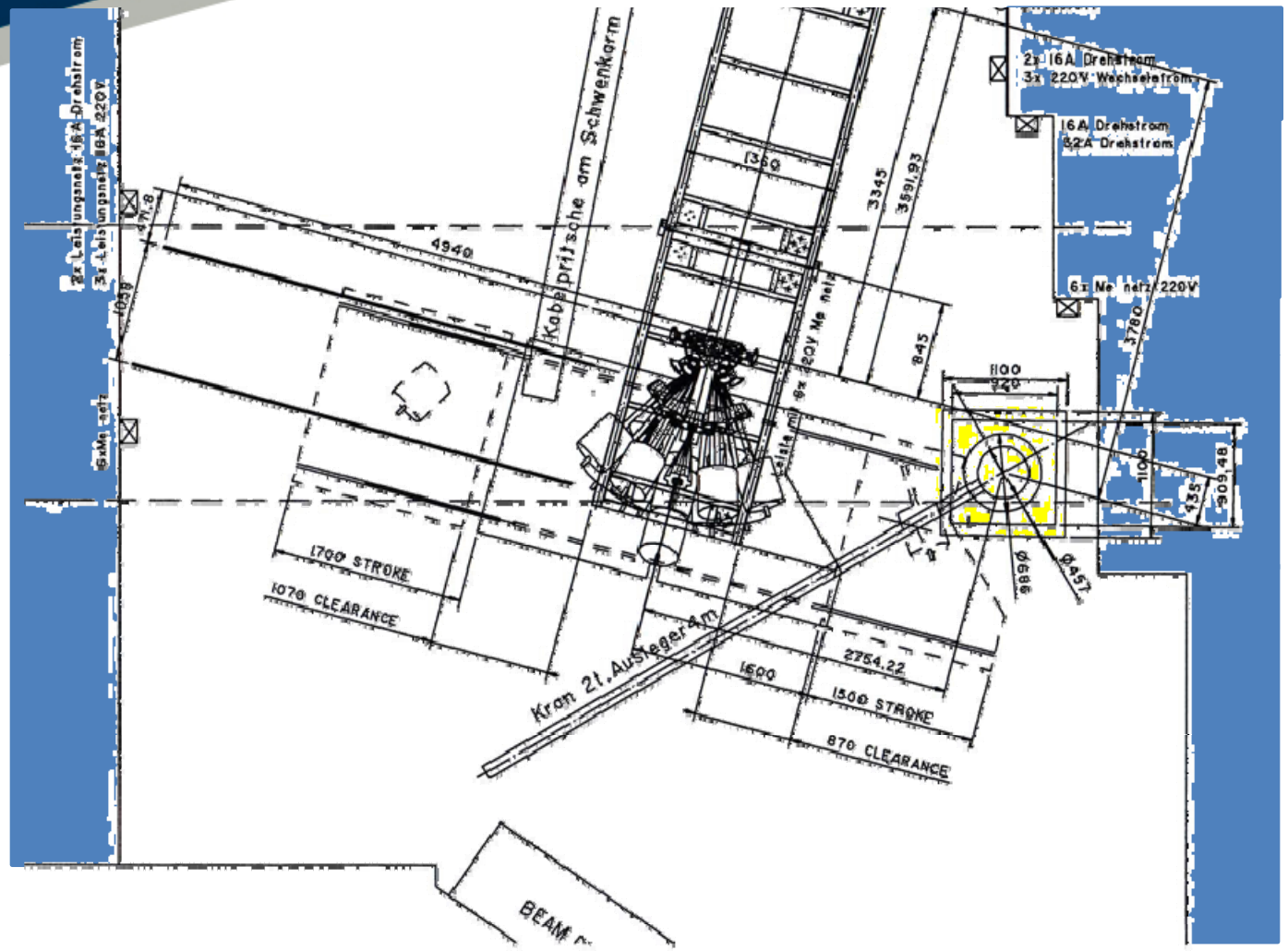
Location Constraints



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Location Constraints