



Science & Technology  
Facilities Council

# Agata Week Uppsala

7<sup>th</sup> – 11<sup>th</sup> July 2008

Mechanical Update  
John Strachan



# Structure

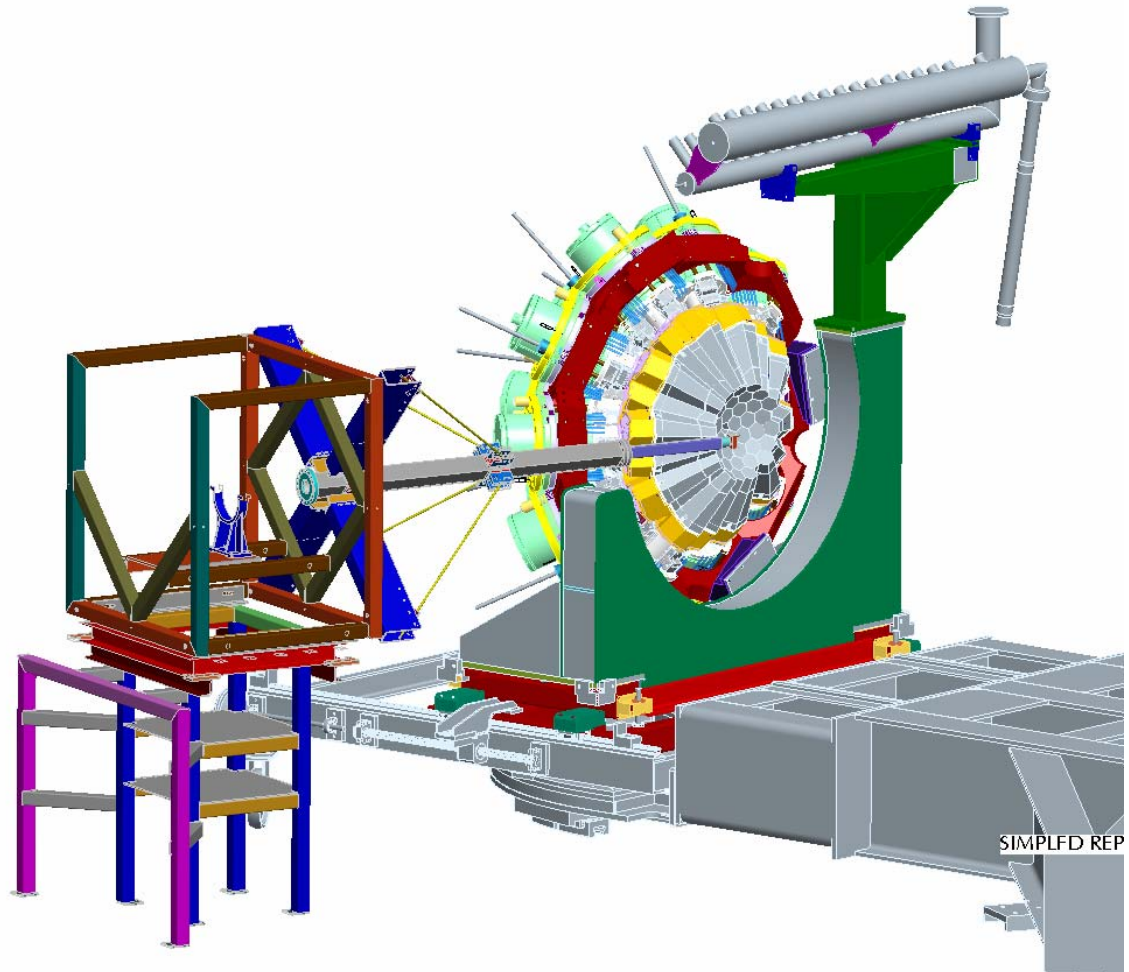
## Main Topics.

### Flanges

- Flange Array Assembly
- Laser Tracker Details
- Assembly Improvements

### Tooling Equipment Update

- Adjustment Mechanism
- Detector Measurement Gauge
- Transportation frame





# Flange Assembly



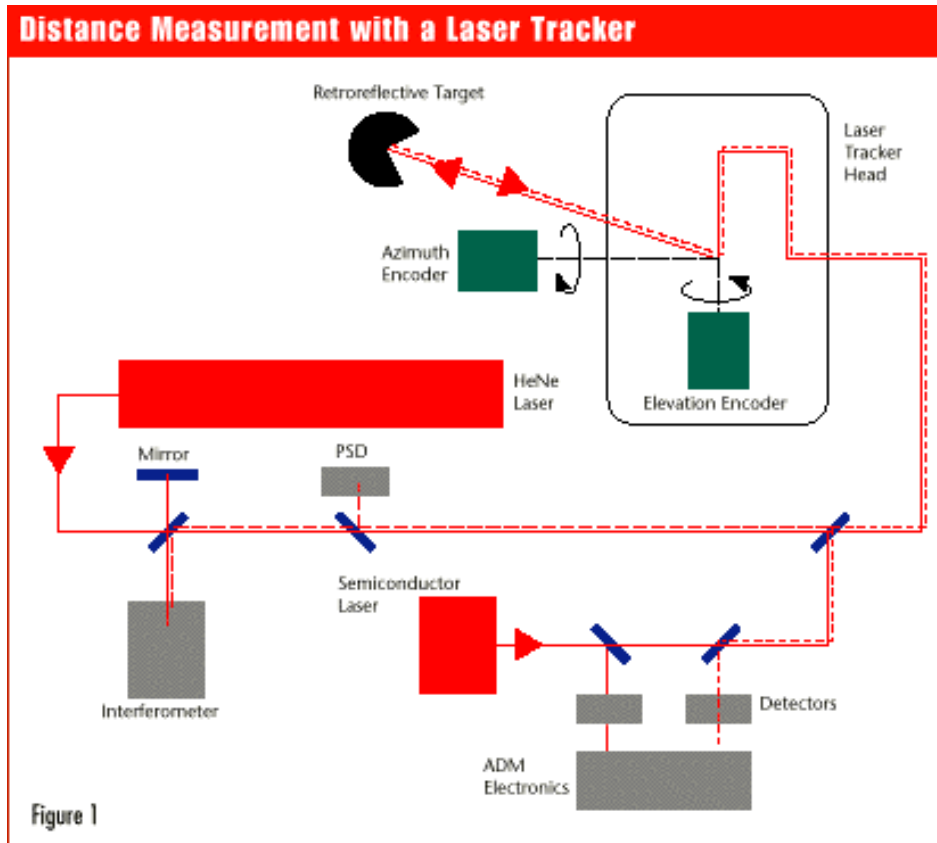
Flange Assembly measured initially with Romer Arm, and finally with Faro Laser Tracker.





# Tracker operation

## General Operating Principles



To position reflector tracker uses  
2 angles and a distance

Angles measured by encoders

Distance measured by lasers

Two Lasers (ADM IFM)

HeNe Laser for IFM

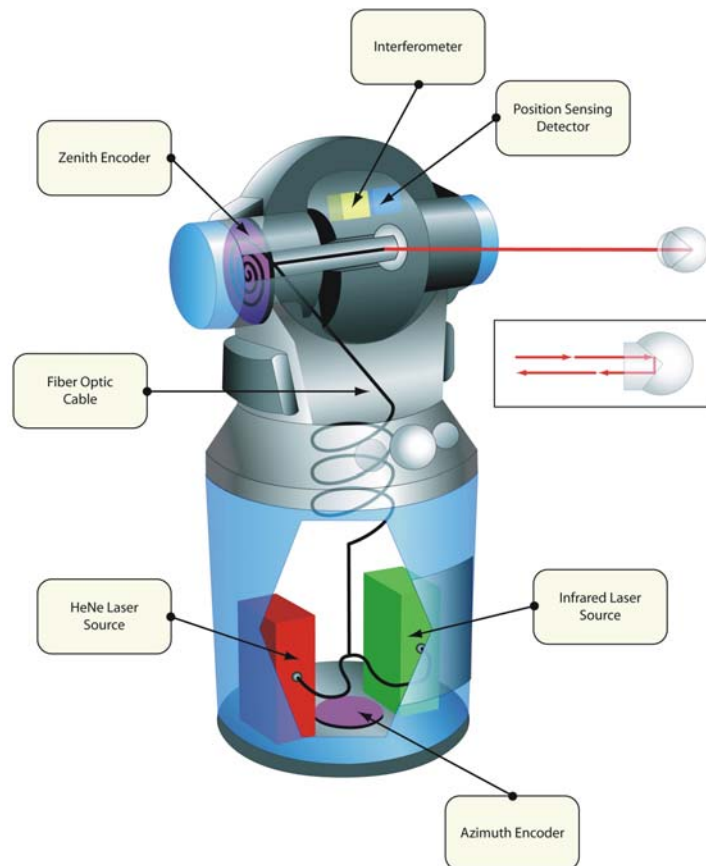
Infrared Laser for ADM

Class II -- LOW-POWERED  
VISIBLE (CW) OR HIGH PRF  
LASERS, won't damage your eye if  
viewed momentarily. Visible beam.  
Maximum power less than 1 mW for  
HeNe.



# Faro Tracker

## Faro Tracker Layout



FARO Laser Tracker

Lasers incorporated in head

Infrared (ADM) wavelength 1550nm

HeNe (IFM) wavelength 633nm

Range 35m

Uncertainty 10 $\mu$ m/m

Compact and Robust design





# Tracker Accuracies

## *Base Tracker*

Horizontal envelope +/- 270°  
Vertical envelope +75° to -50°  
Angular resolution 0.02 arcseconds  
Angular repeatability 2µm + 2µm/m  
Angular accuracy 18µm + 3 µm/m  
Maximum angular measurement velocity 180°/sec

Encoder specs

## *Interferometer*

Point acquisition rate Up to 1000 samples/sec  
Range resolution 0.158µm  
Repeatability 1µm + 1µm/m @ 1000samples/sec  
Accuracy 10µm + 0.8µm/m  
Minimum working range 0m  
Maximum working range 35m  
Maximum radial velocity 4m/sec

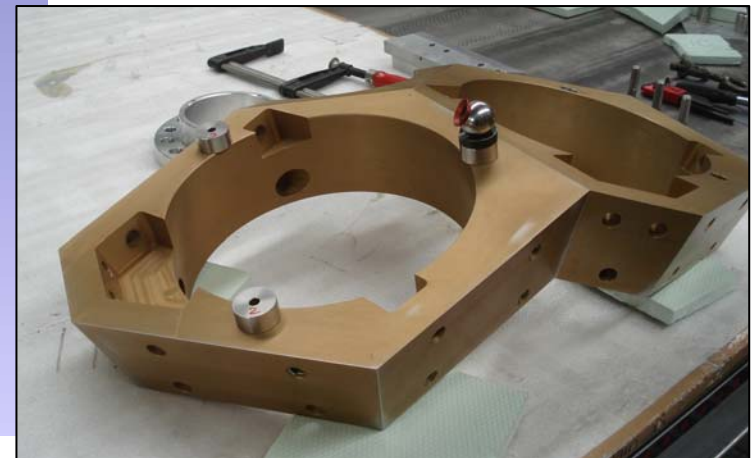
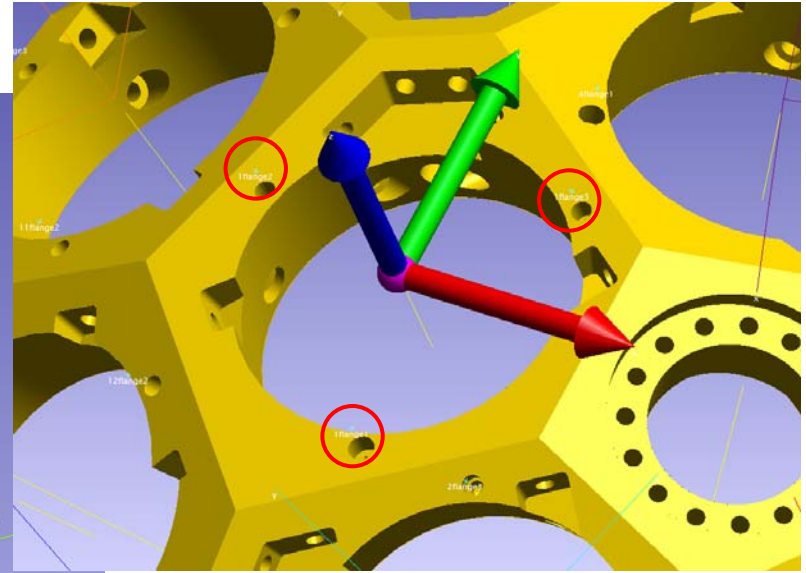
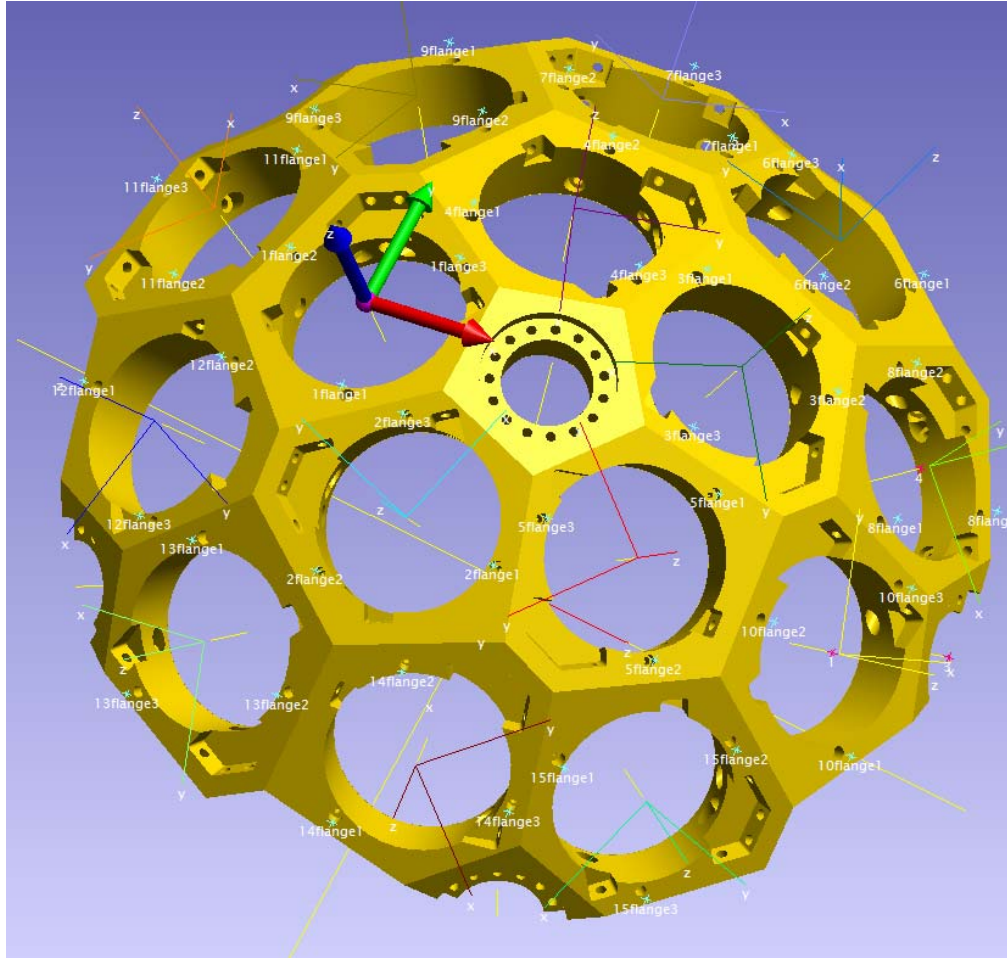
## *SuperADM*

Point acquisition rate Up to 1000 samples/sec  
Resolution 0.5µm at 100 samples/sec  
Repeatability 7µm + 1µm/m @ 100 samples/sec  
Accuracy 20µm + 1.1µm/m @ 100 samples/sec  
Minimum working range 0m  
Maximum working range 35m  
Maximum radial velocity Unlimited

Distance measurement specs

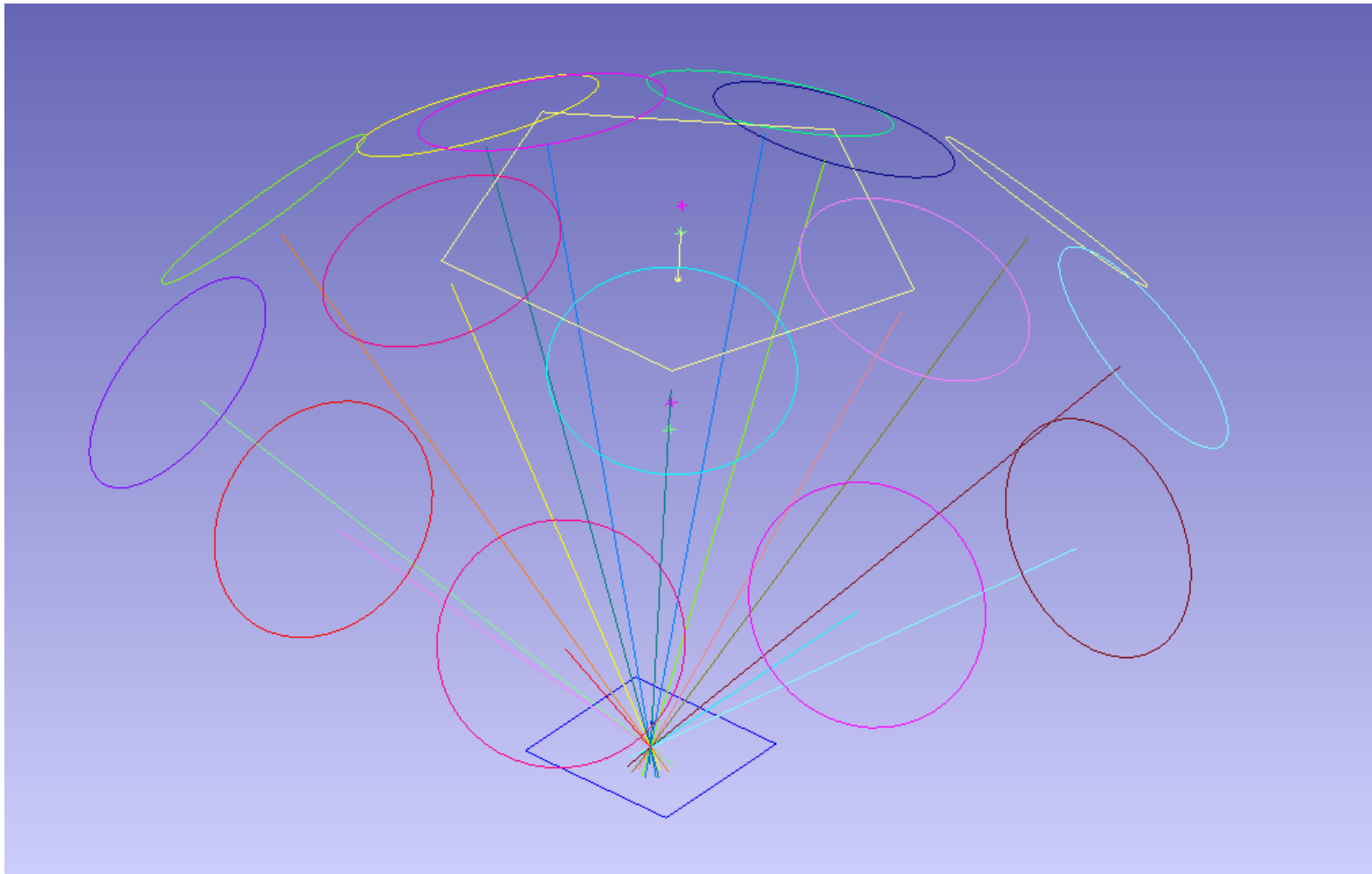


# Assembling flanges





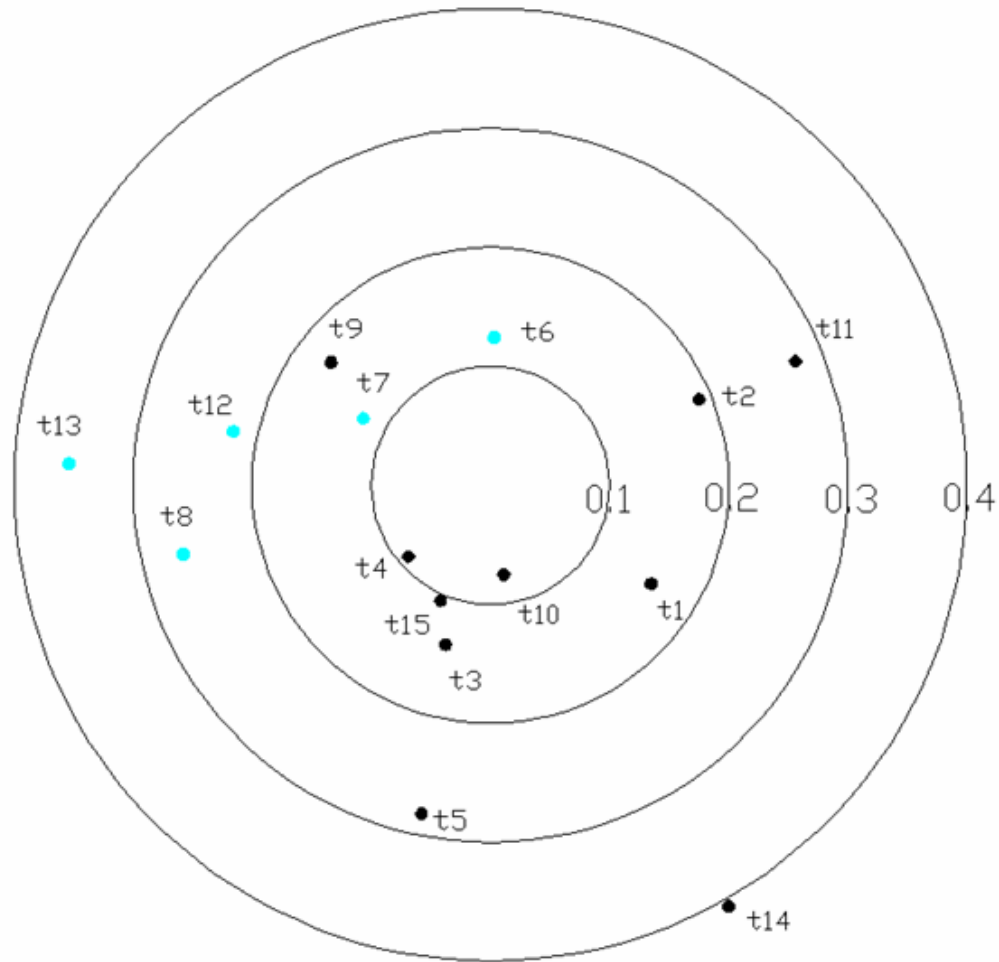
# Target definition







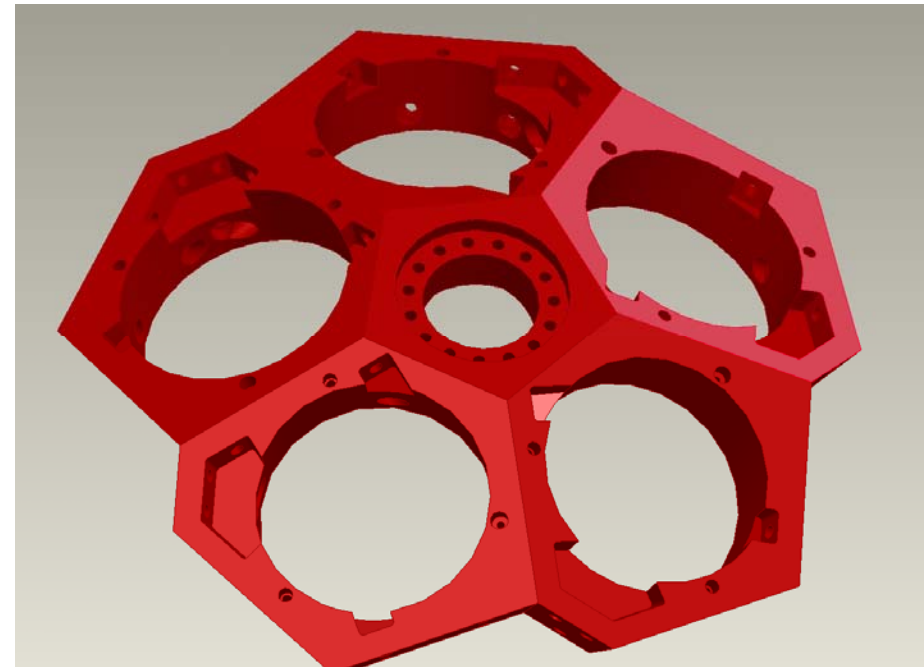
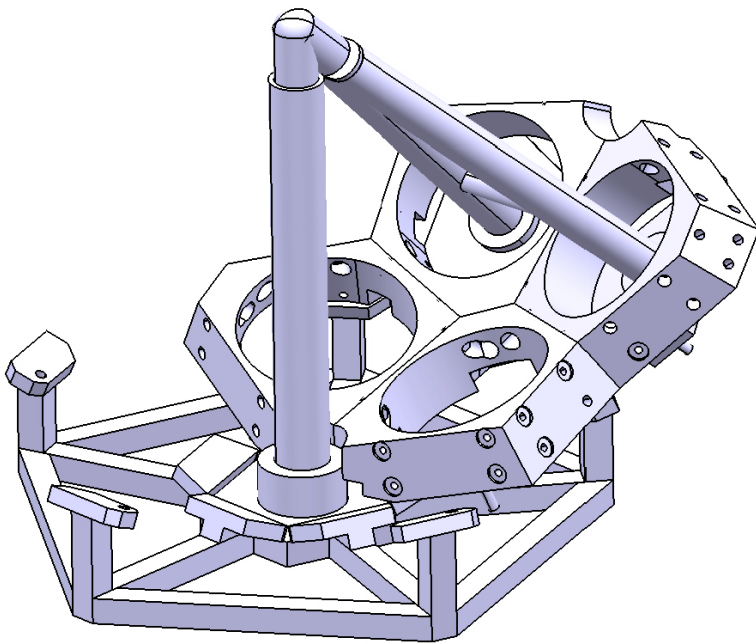
# Results





# Improvements

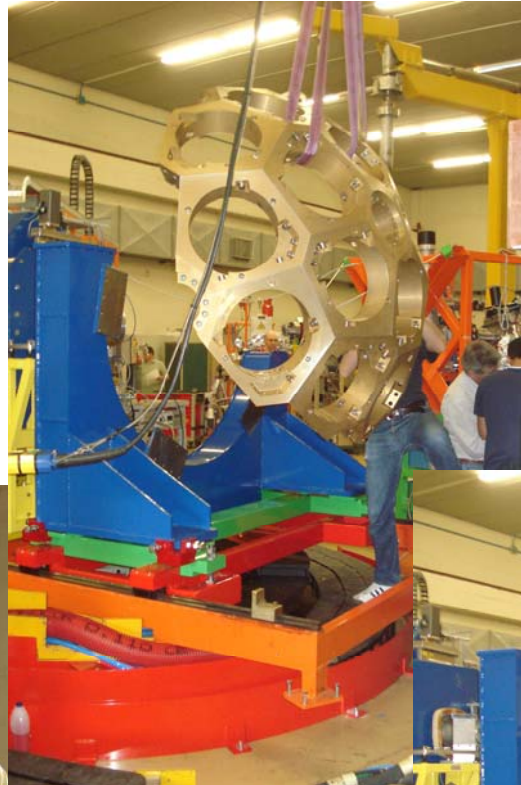
Possible improvements are to make 1 large flange to take the place of 5.



And/or Create a tooling jig to allow for easy alignment of 5 flanges.



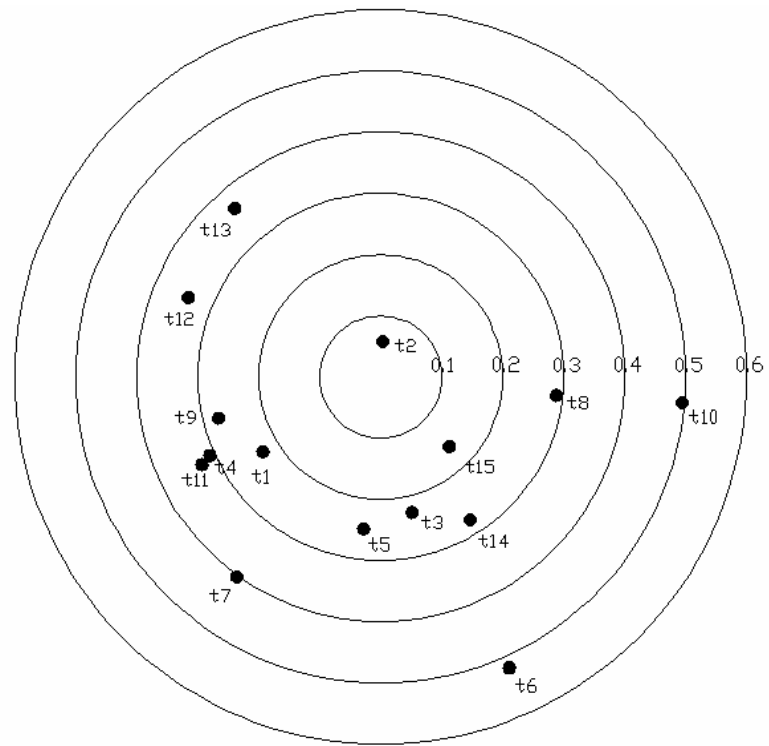
# Installation of Flanges







# Final Survey

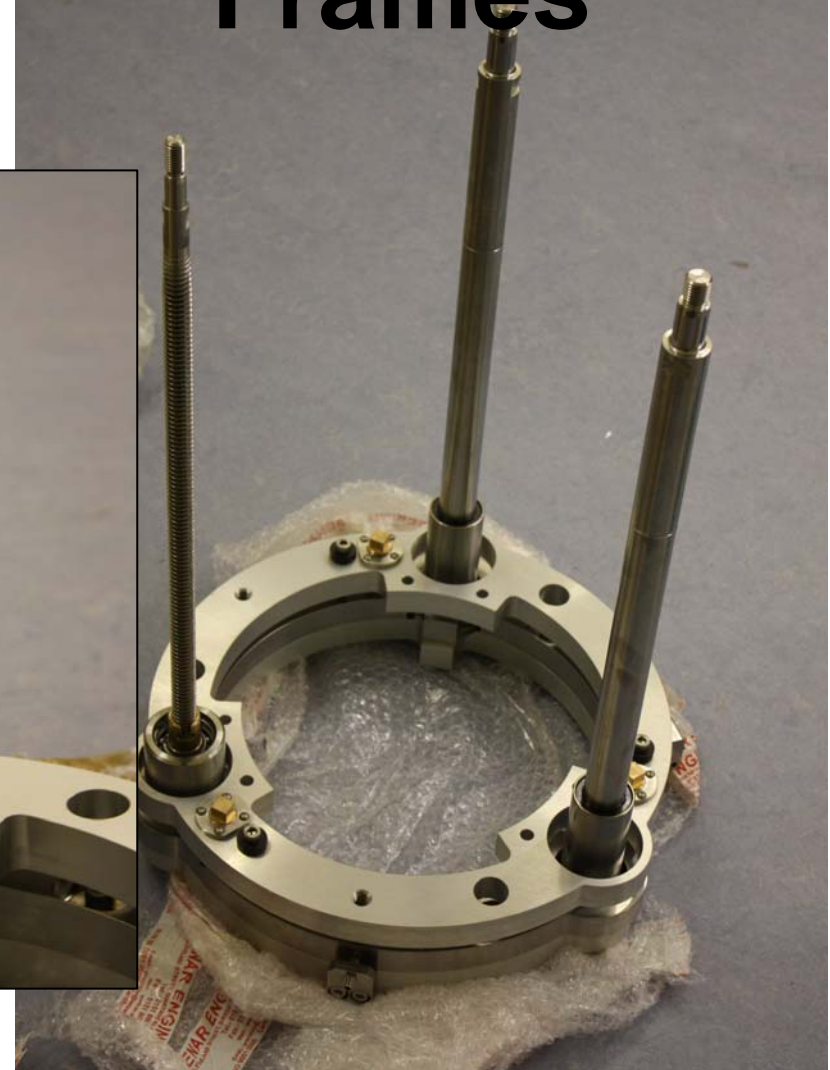
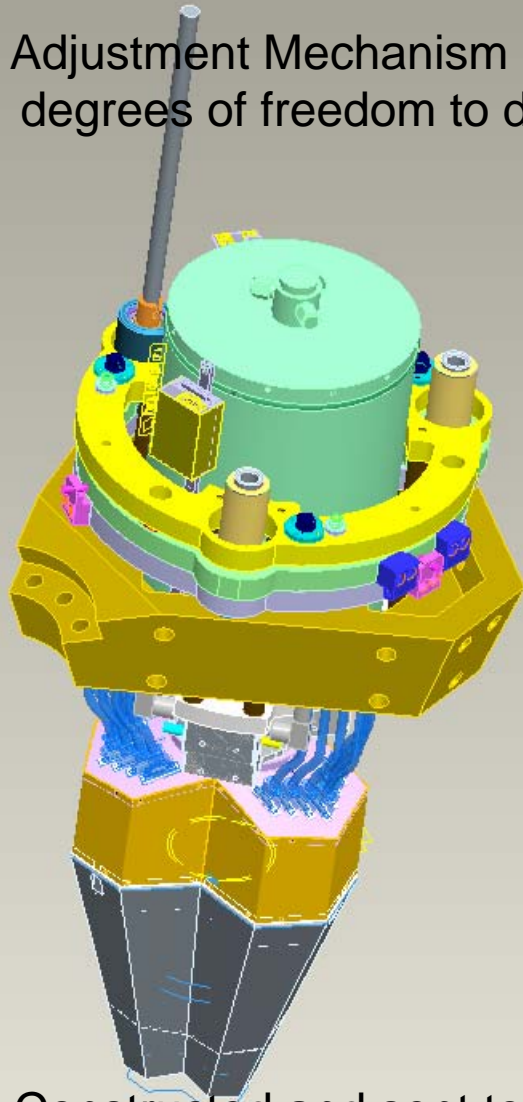






# Detector Adjustment Frames

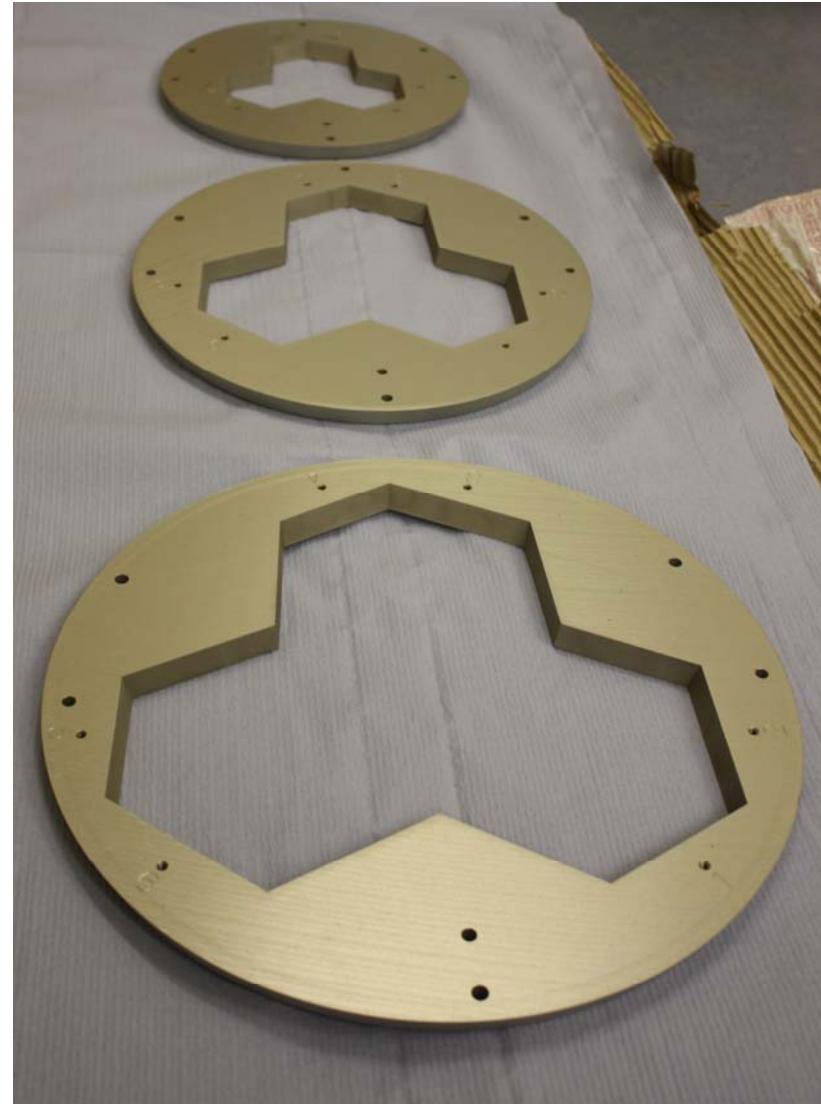
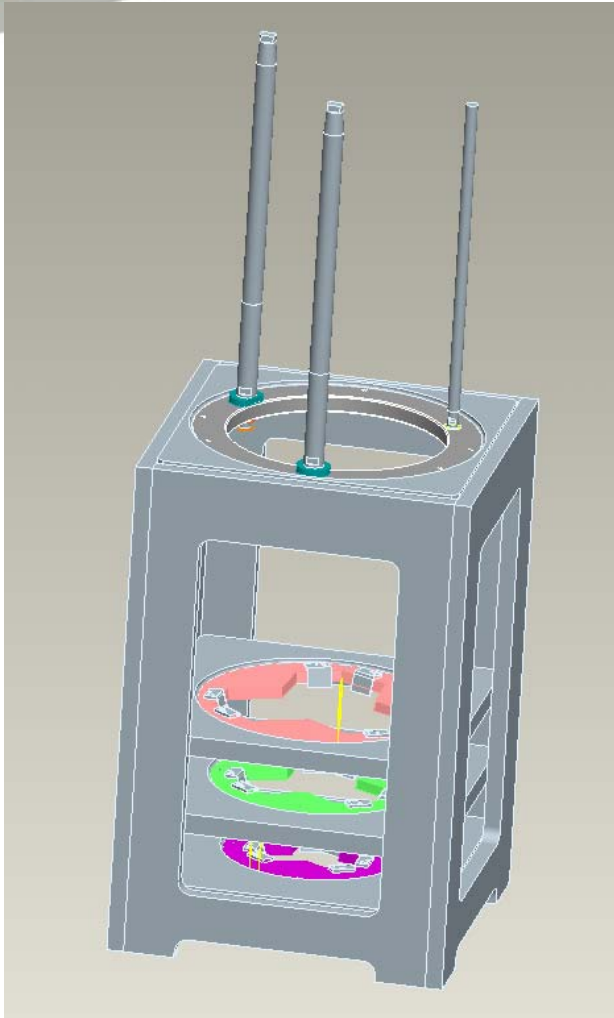
Adjustment Mechanism giving 6  
degrees of freedom to detector



Constructed and sent to Legnaro



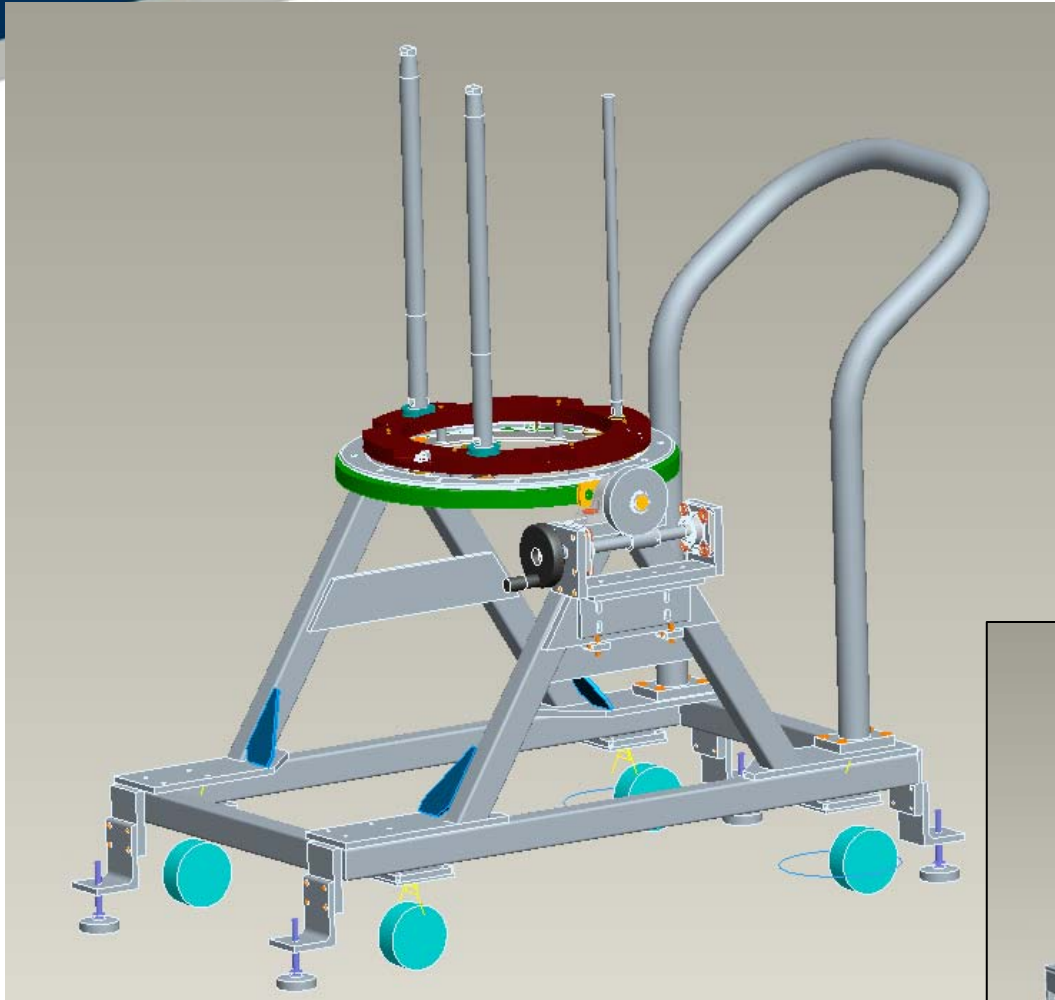
# Detector Gauge



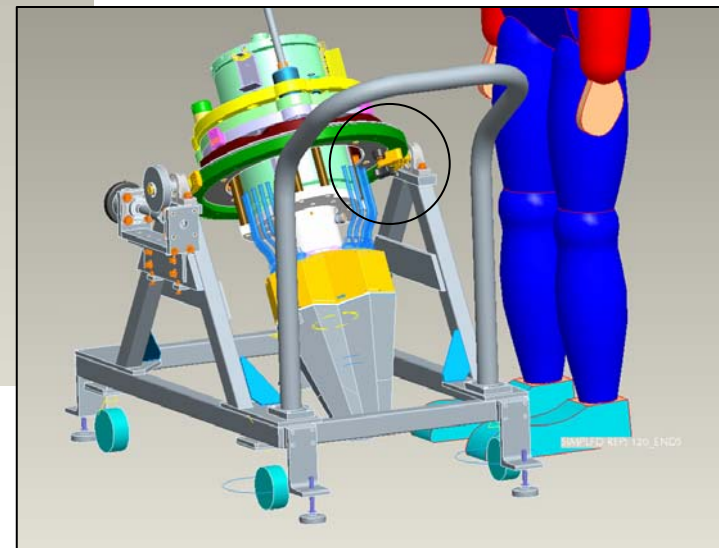
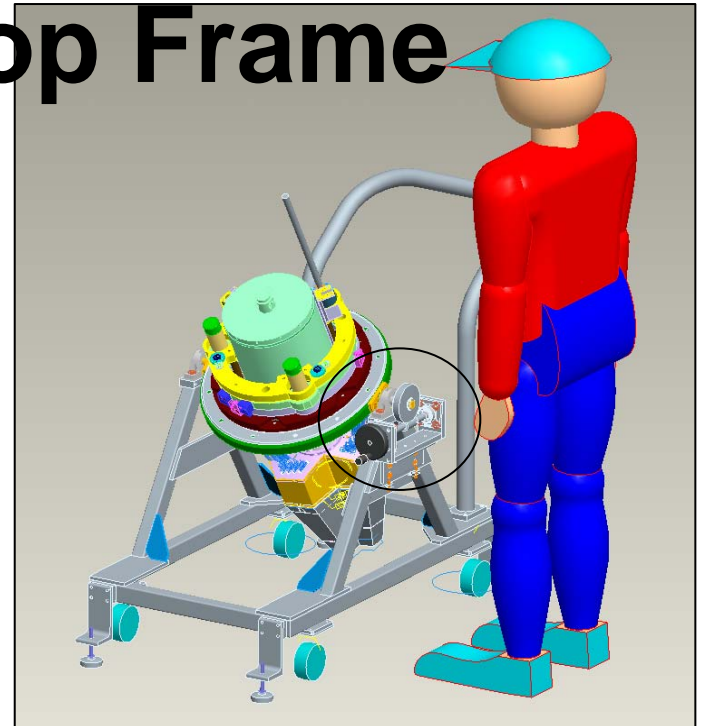
All parts other than frame on-site. Frame expected Mid July



# Table Top Frame



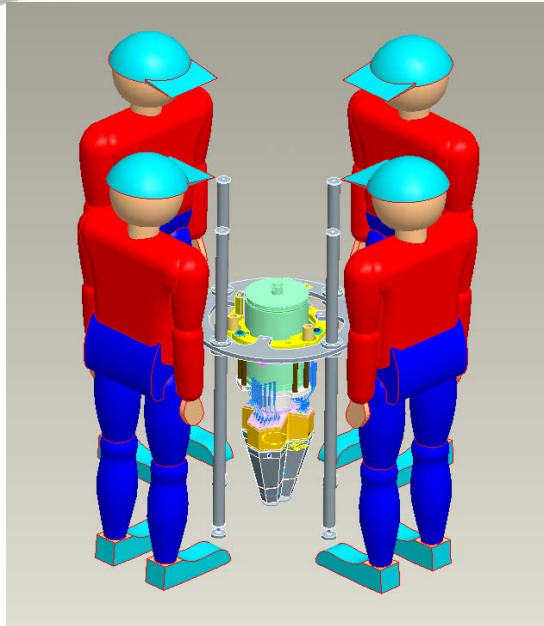
Under construction at Milan







# Transport Frame



Transport Frame On-site







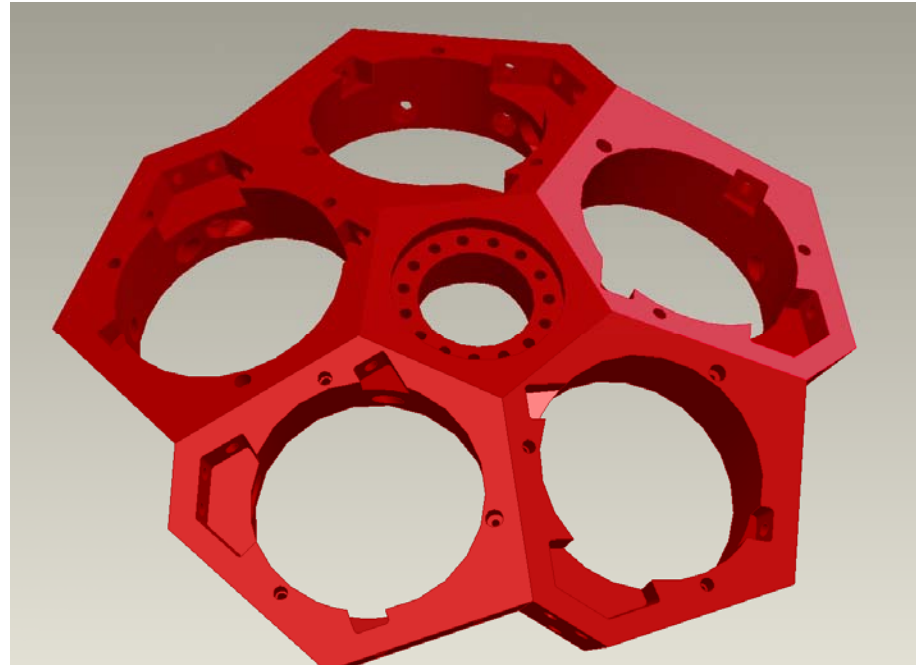
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# Agata Full ball



# Improvements

Possible improvements are to make 1 large flange to take the place of 5.

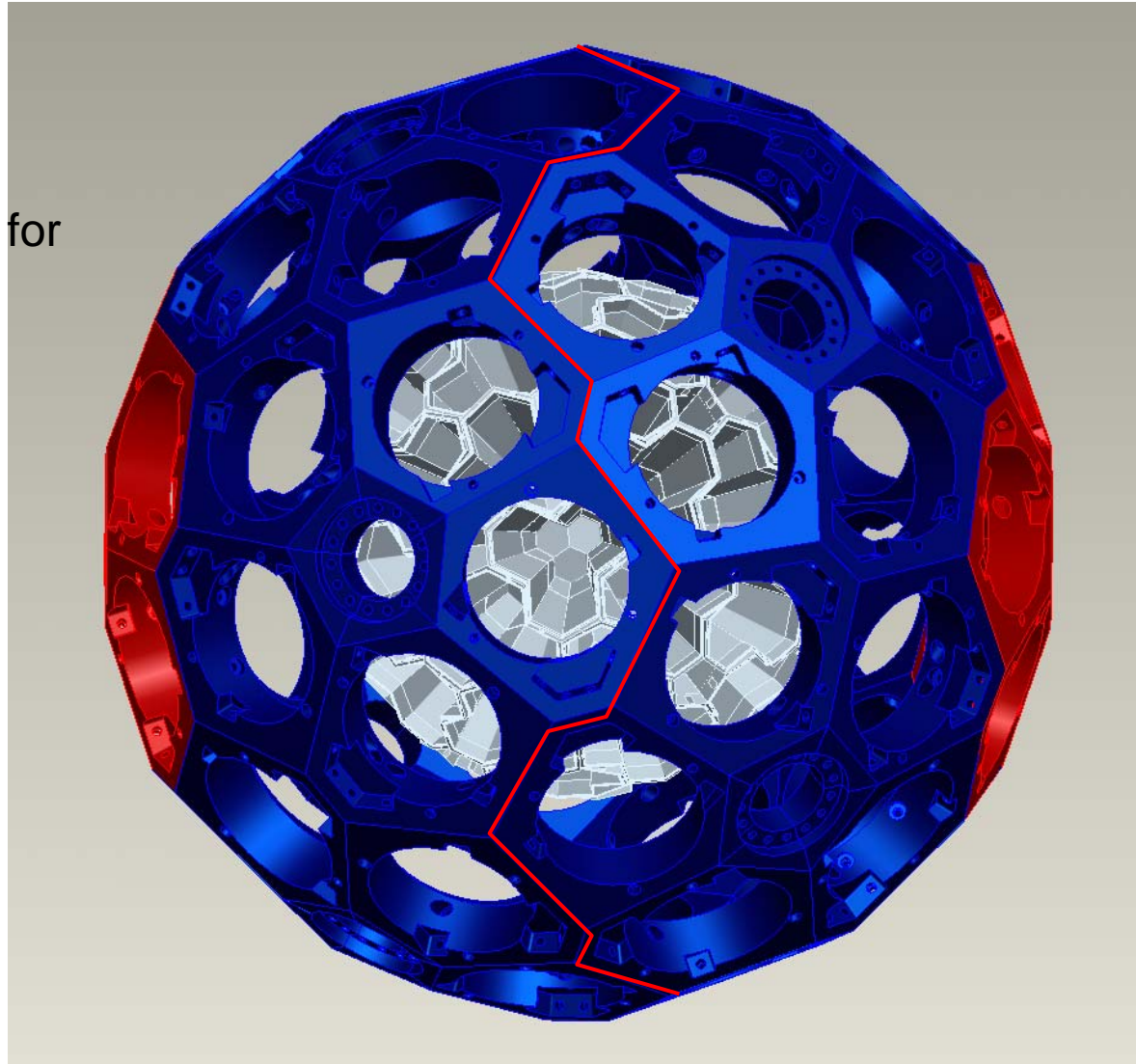


And/or Create a tooling jig to allow for easy alignment of 5 flanges.



# Natural Splitline

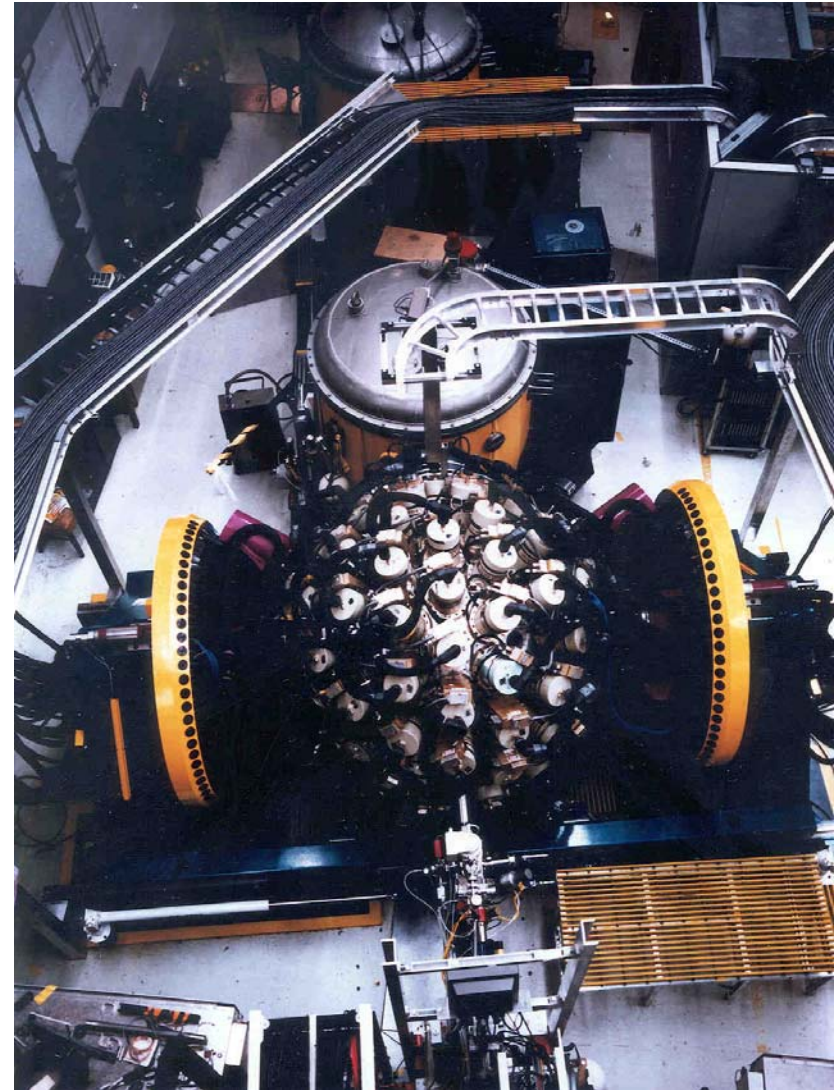
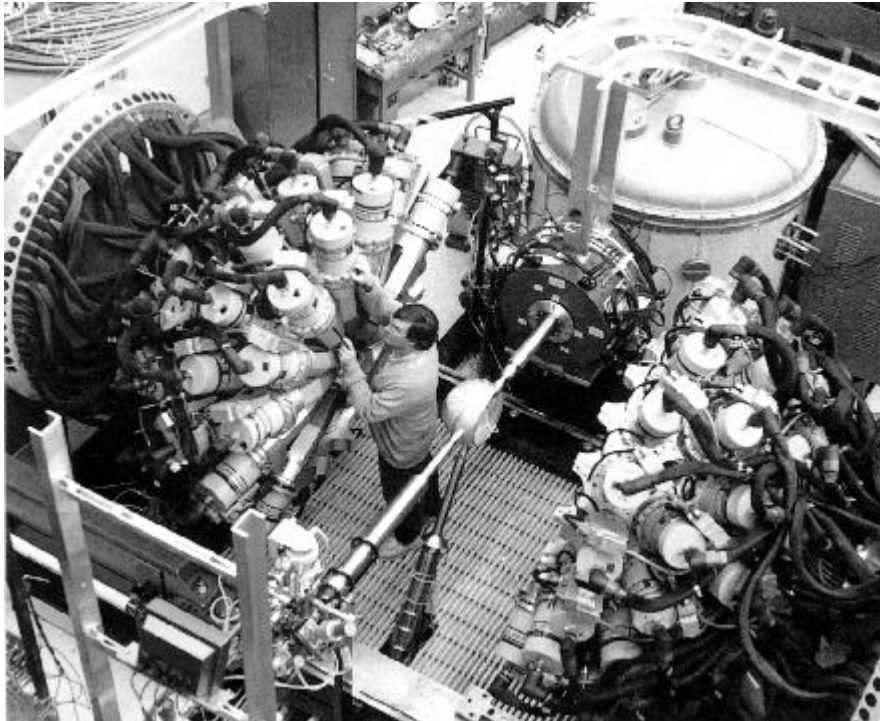
Natural splitline for  
AGATA







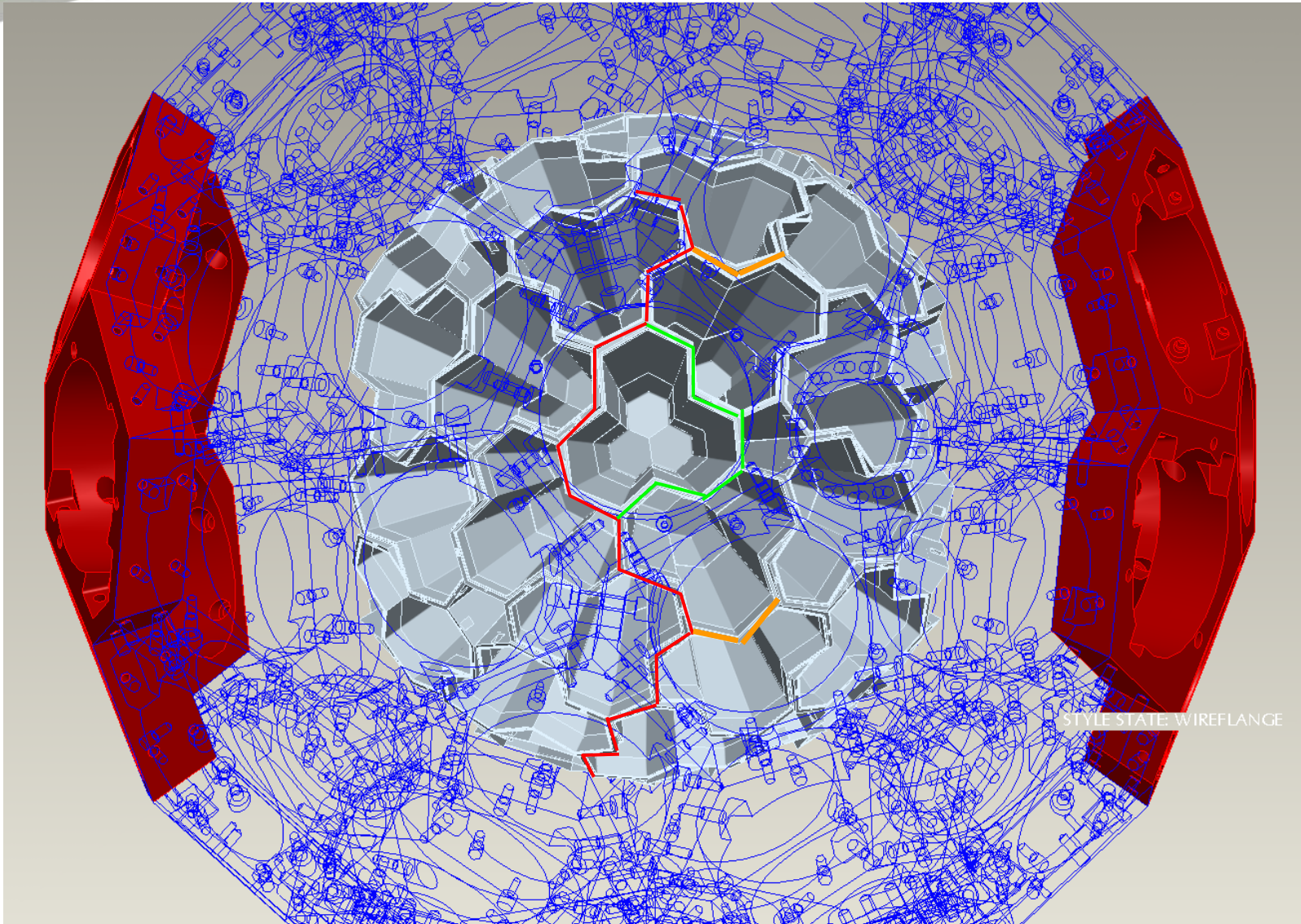
# GammaSphere





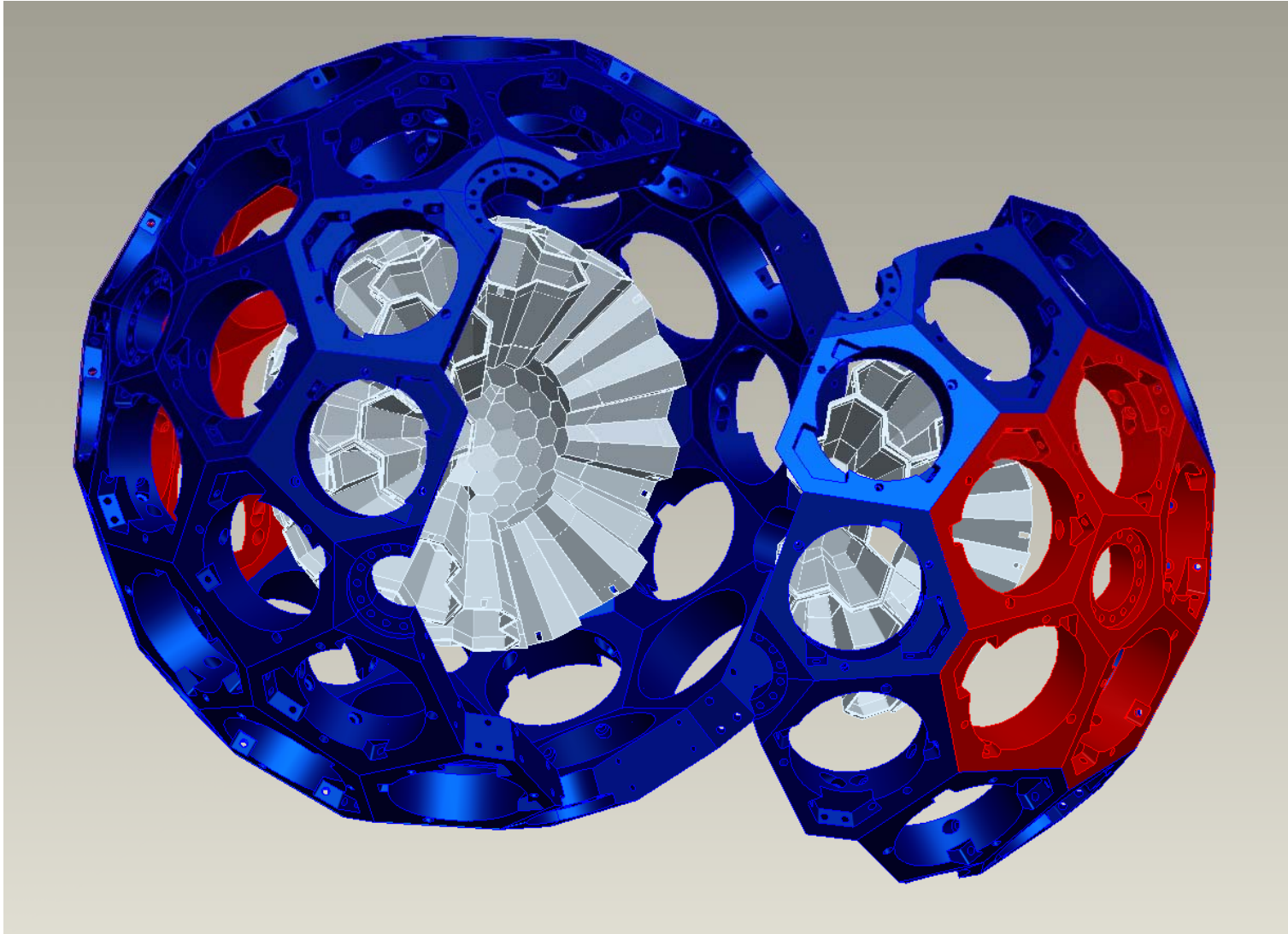


# Other Splitlines





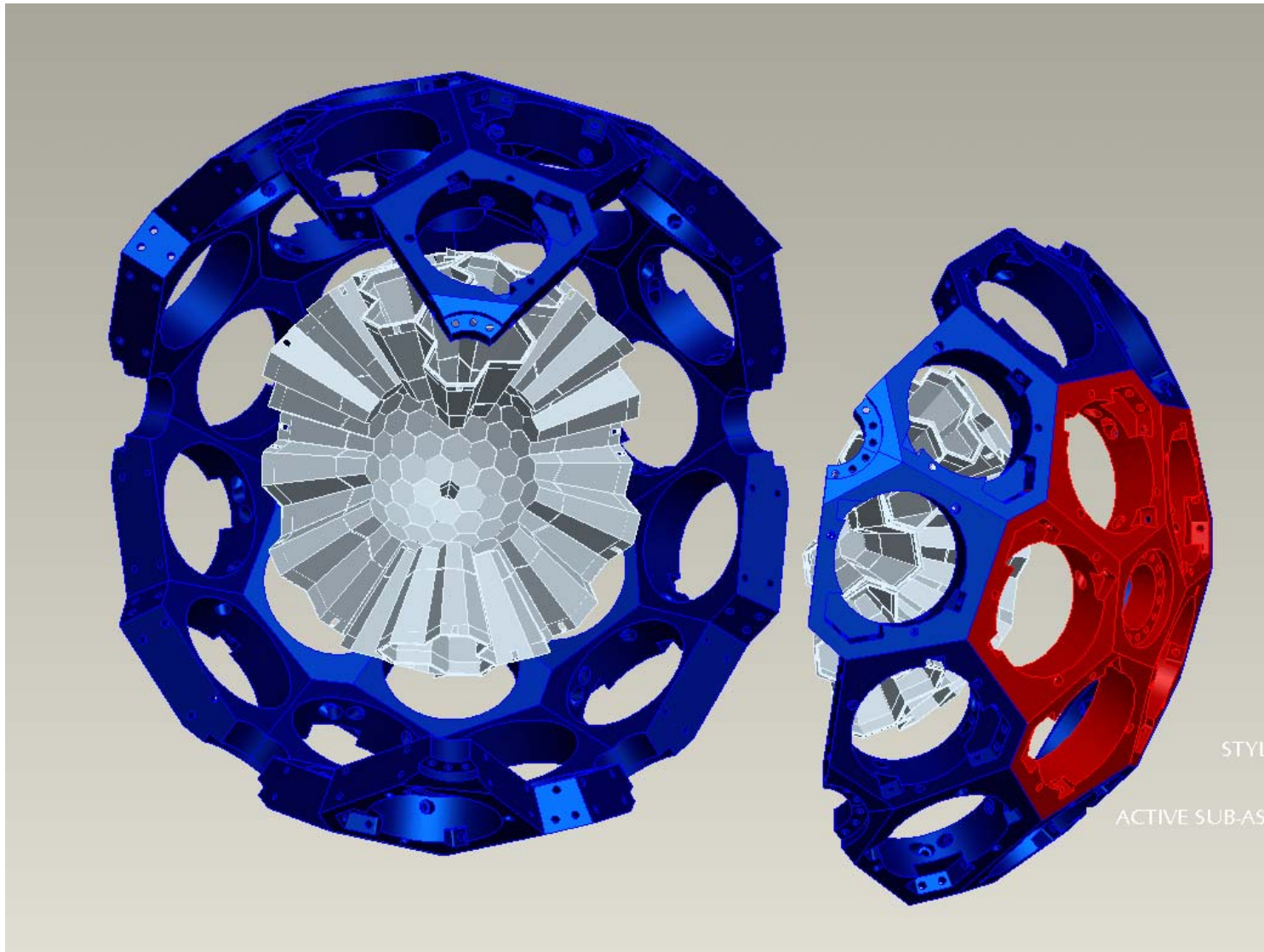
# Agata Splitline







# Agata Splitline 270







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# Questions