



# LCGT SAS design status

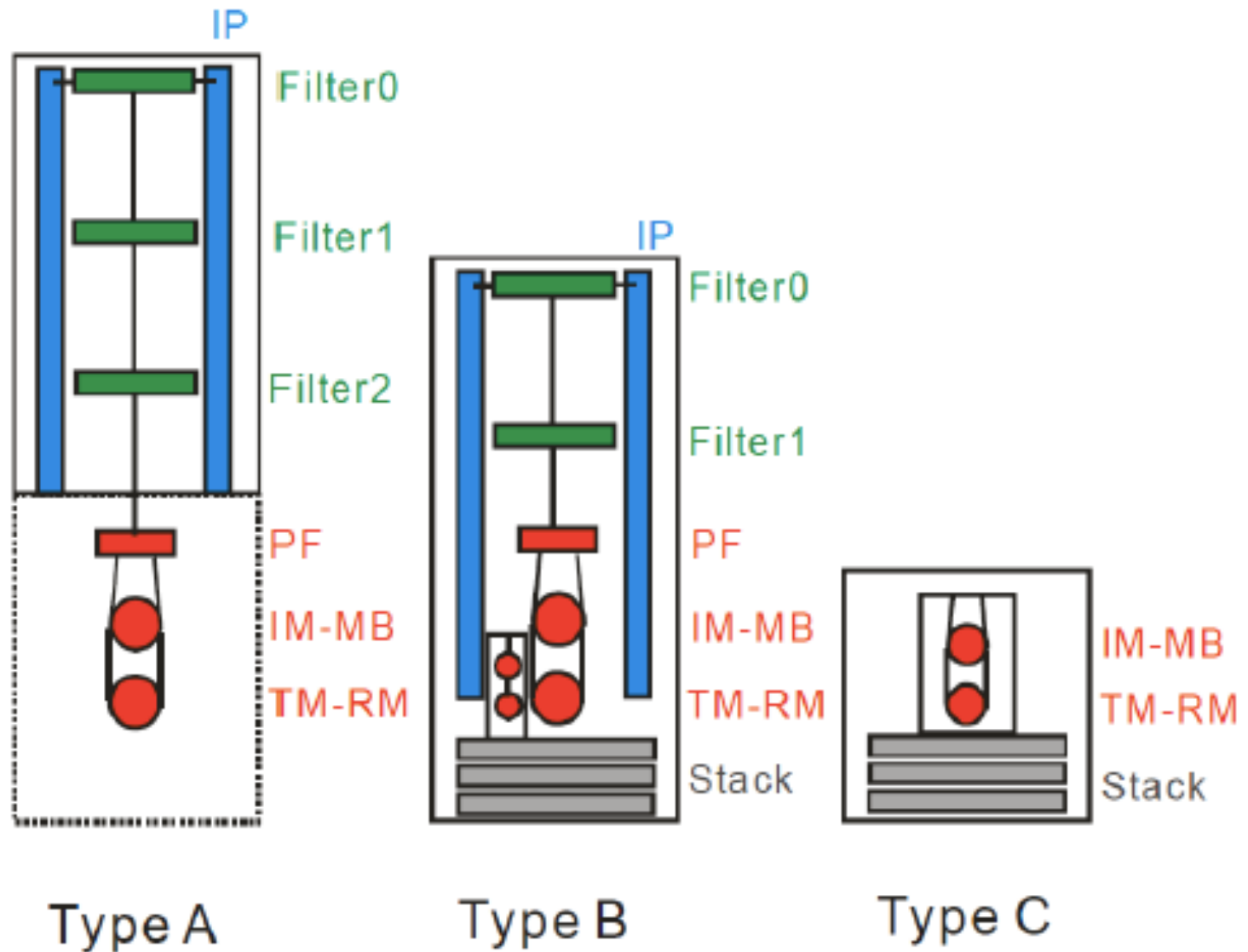
Takanori Sekiguchi,  
Ryutaro Takahashi, Riccardo DeSalvo

The structure and functions of  
LCGT SAS

JGW-G1100311



# Attenuator types





# LCGT SAS general design

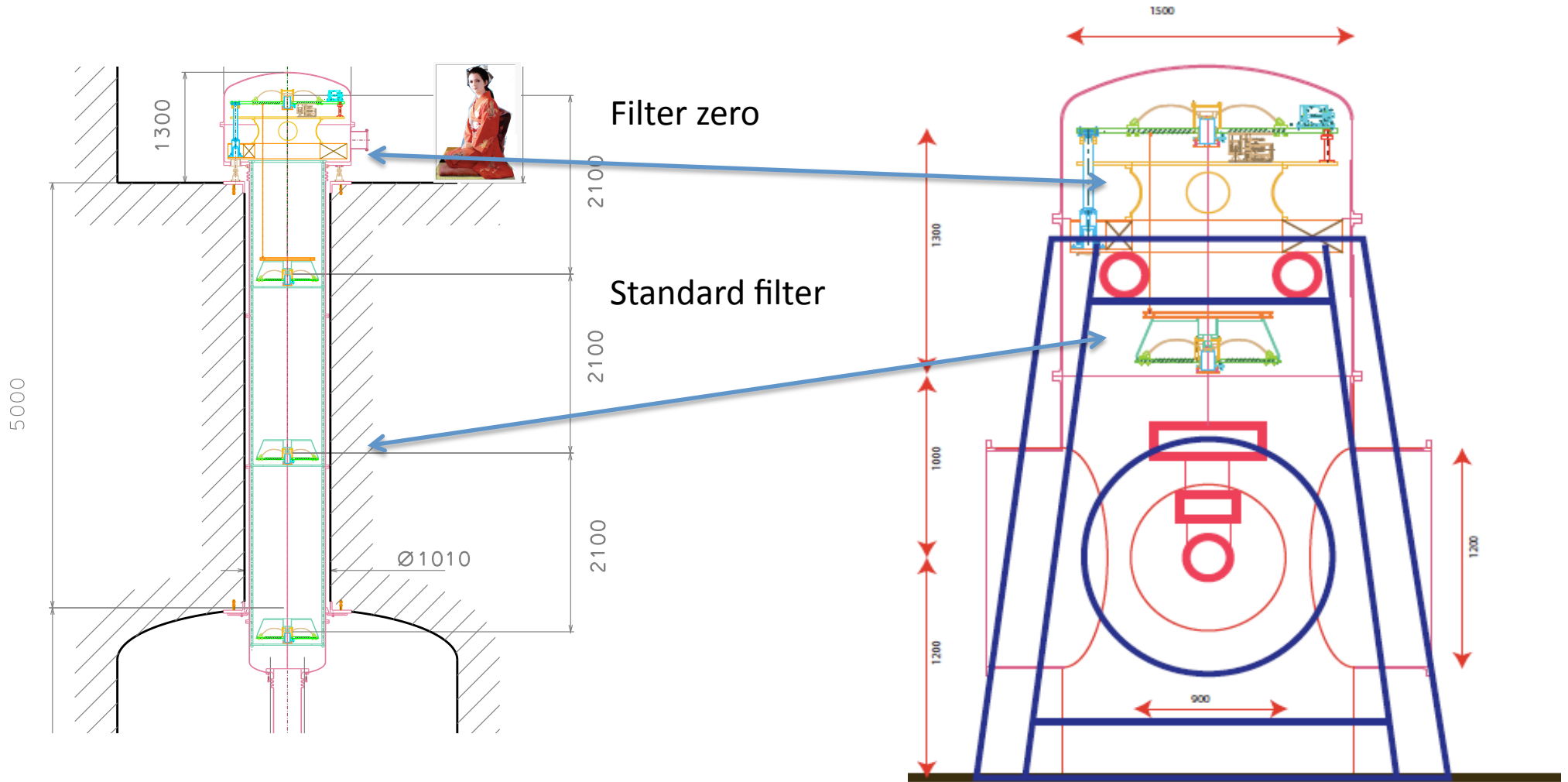
- Passive seismic attenuation
- Based on Geometric Anti Springs (GAS)
- Pendula
- and inverted pendula (IP) on the first stage



## Modular design

### Type A

### Type B

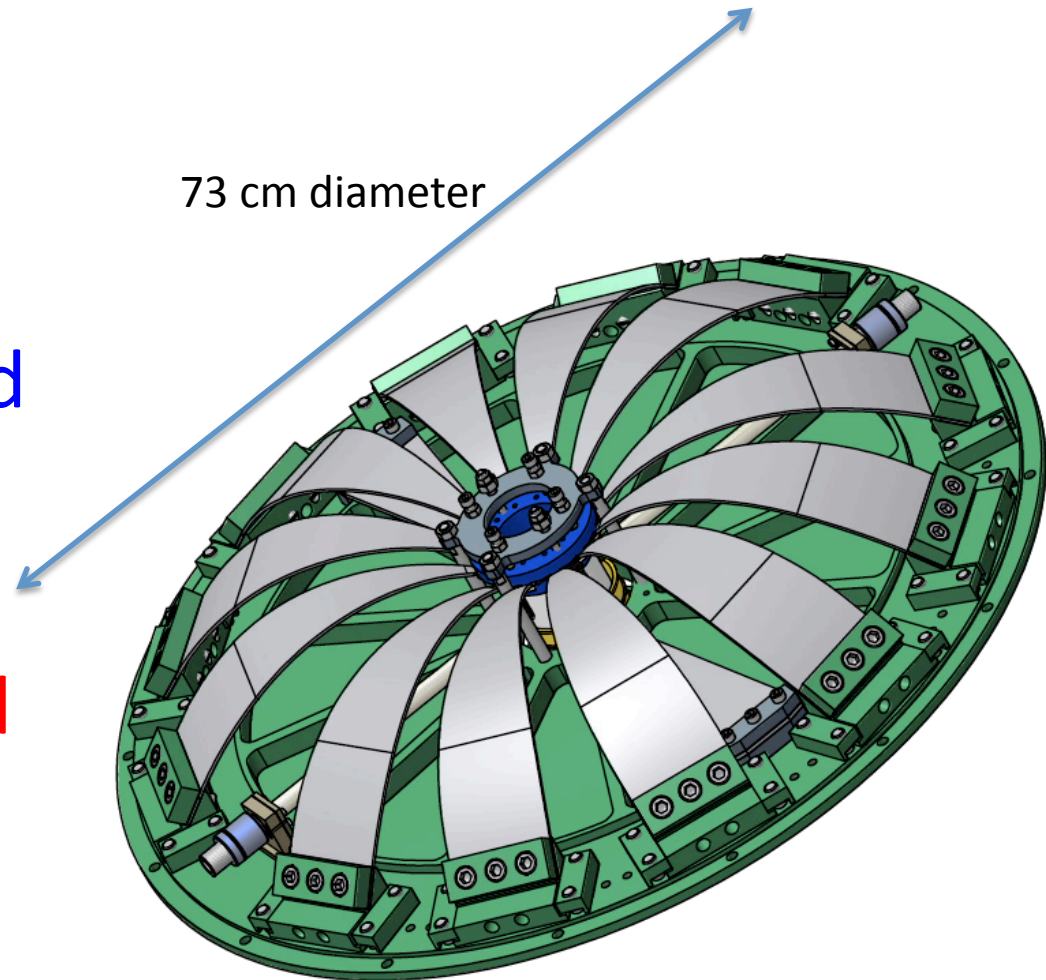






# Standard modular filter

- Up to twelve blades
- 100 to 600 kg load
- Change number and size of blades to match required load

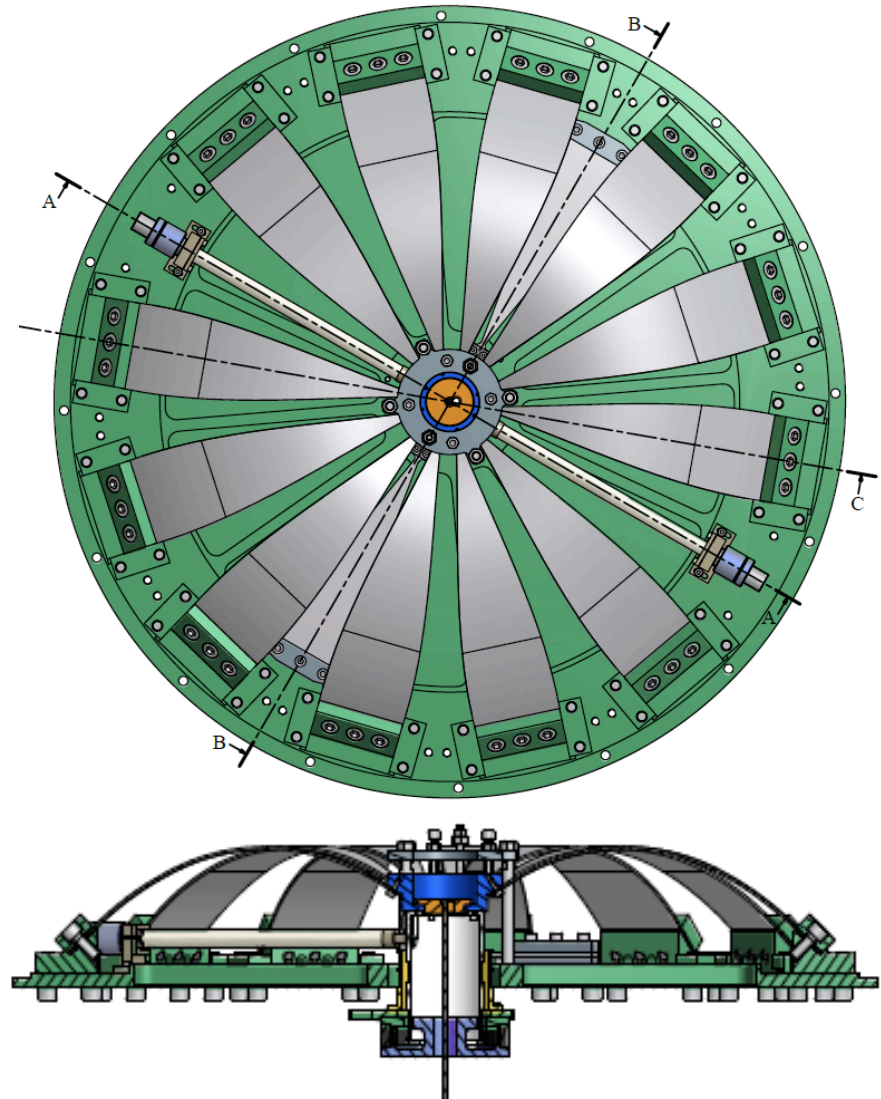


85 kg mass



# Standard filter performance

- Magic wands,
  - Peak attenuation 90 dB
- Passive frequency tuning by changing radial compression
- LVDT/Actuator for compensation, frequency tuning, . . .

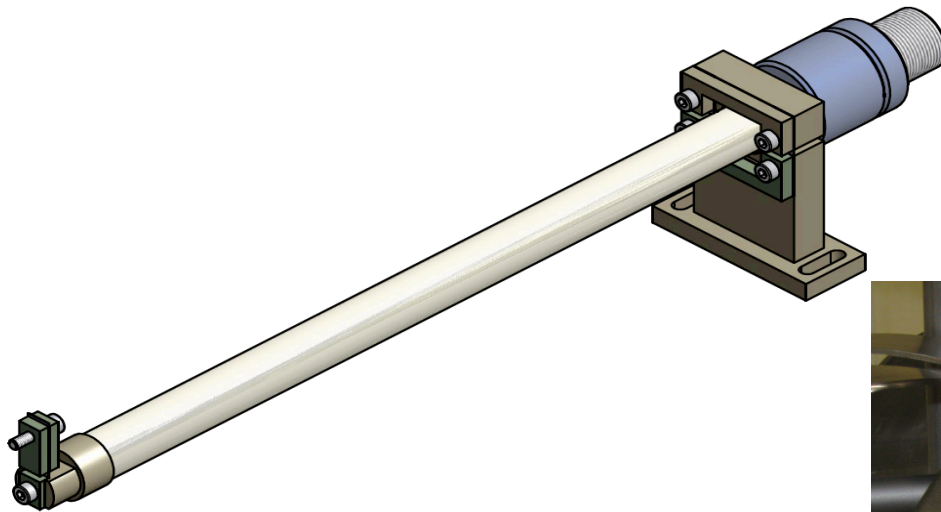


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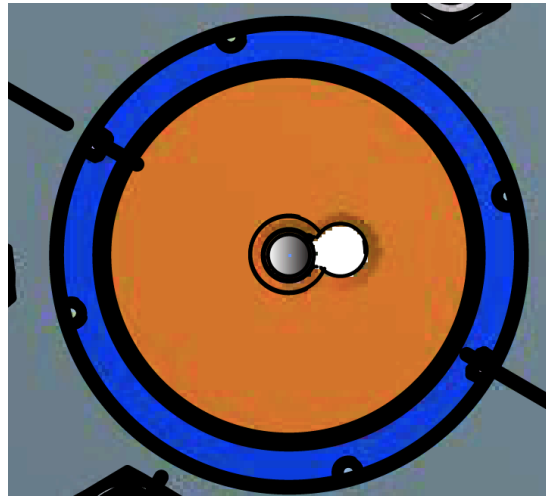
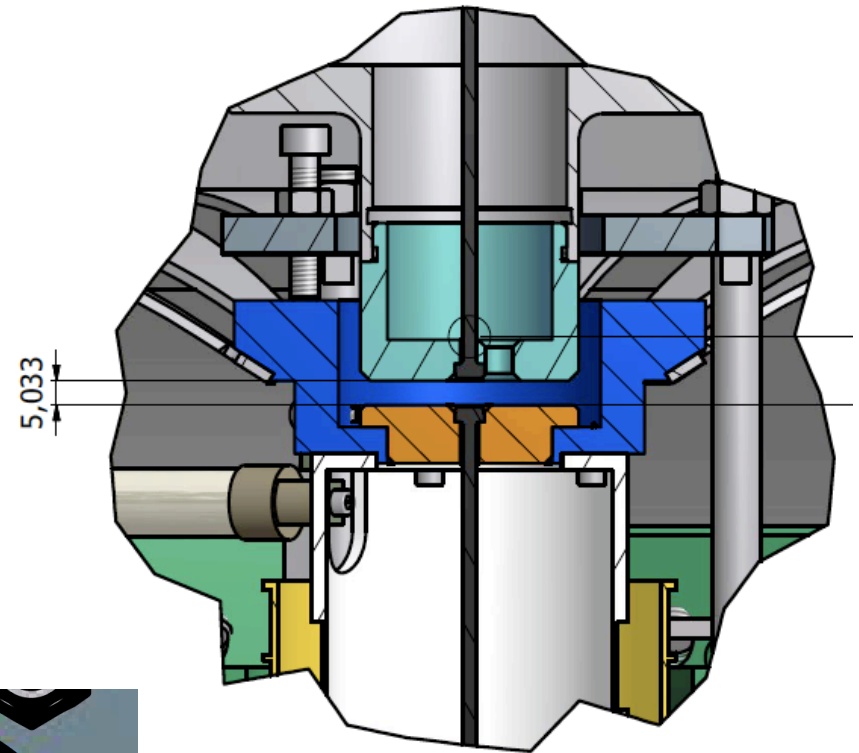
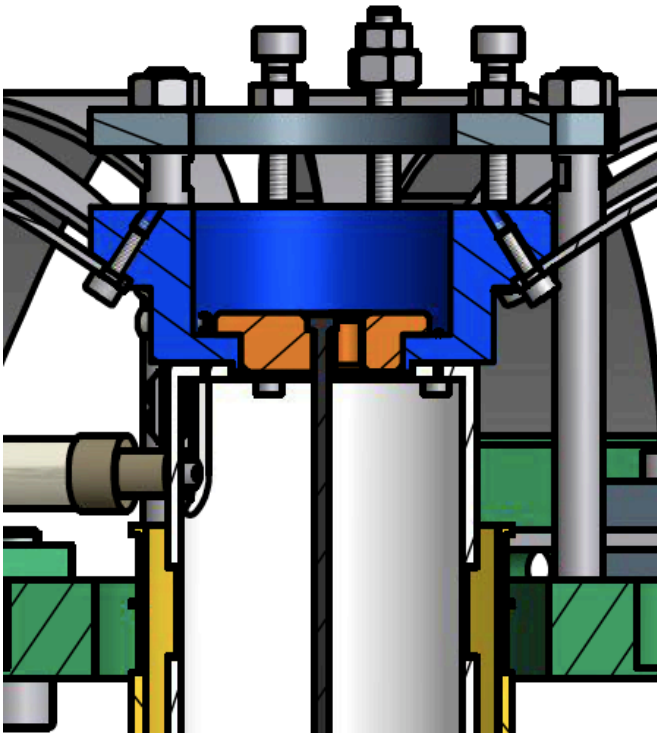
# Magic wands

- Compensate center of percussion limitations





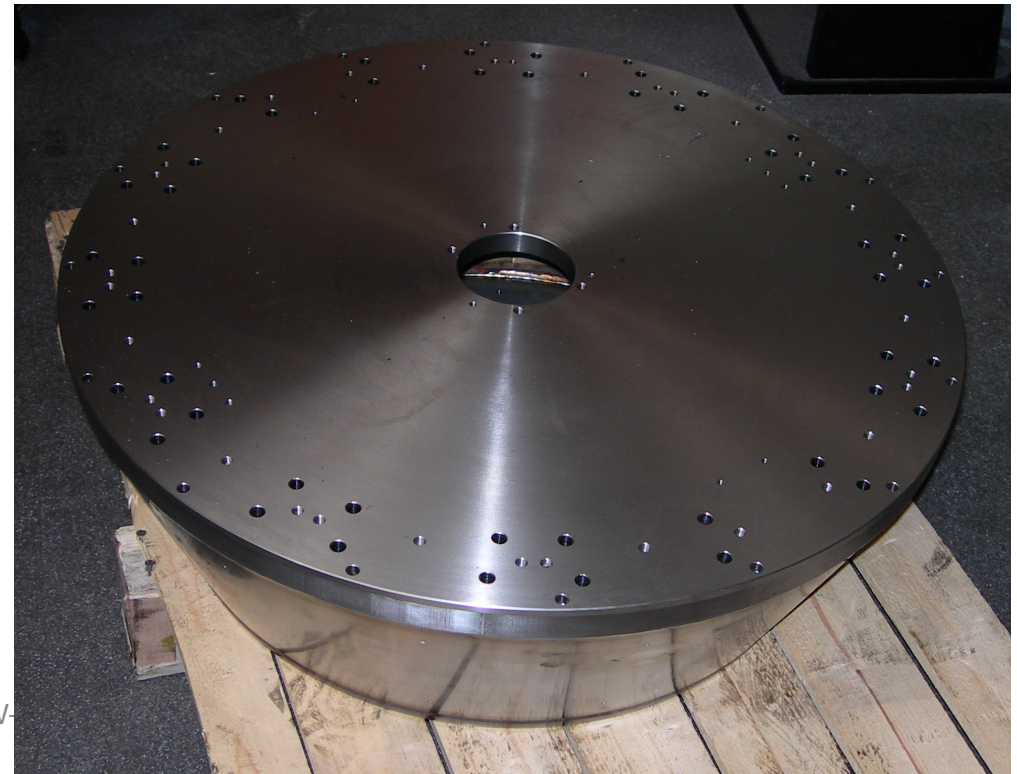
# Rapid suspension wire hooking







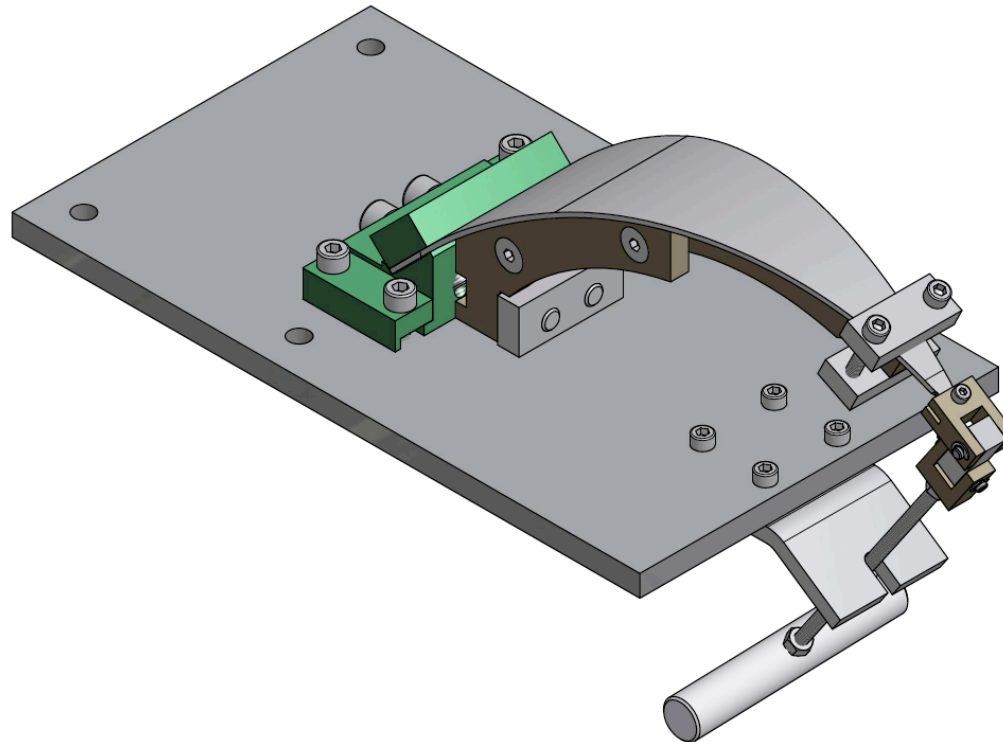
# Standard filter machining





# Modular-rapid blade assembly

- Specialized tooling

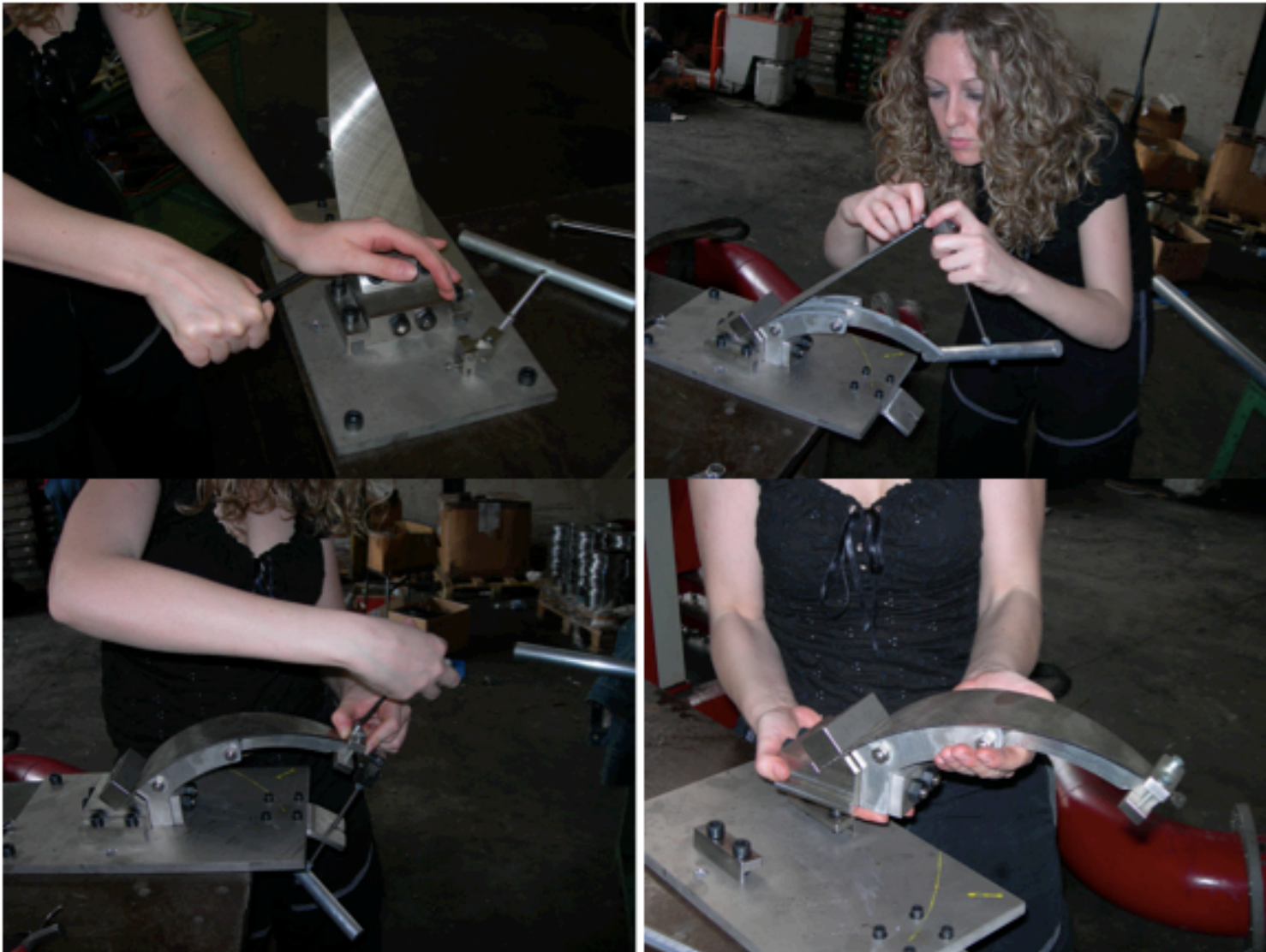


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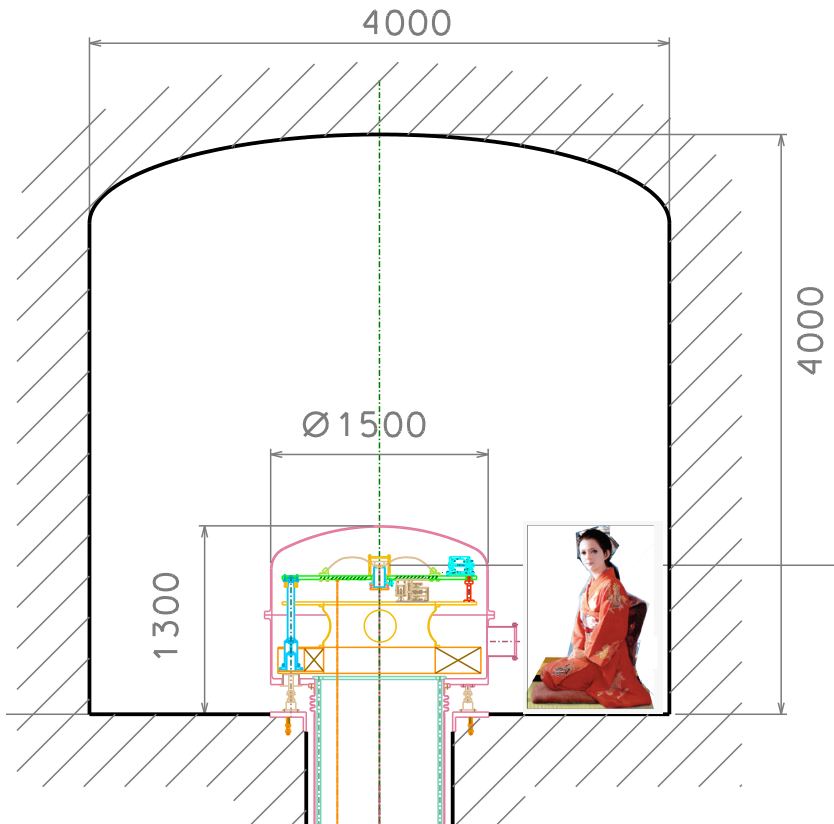


# Easy to assemble





# The filter zero and IP table

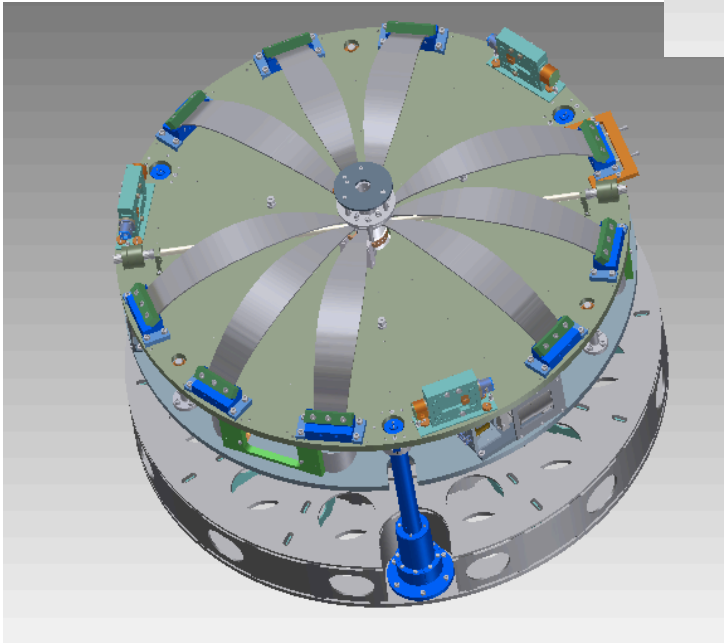
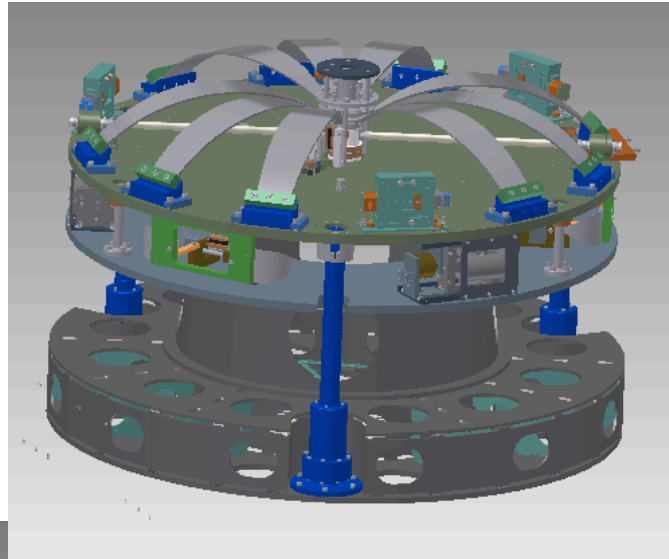


- footed on solid rock
- Inverted Pendulum table with short legs
- Large GAS filter
- Easily accessible



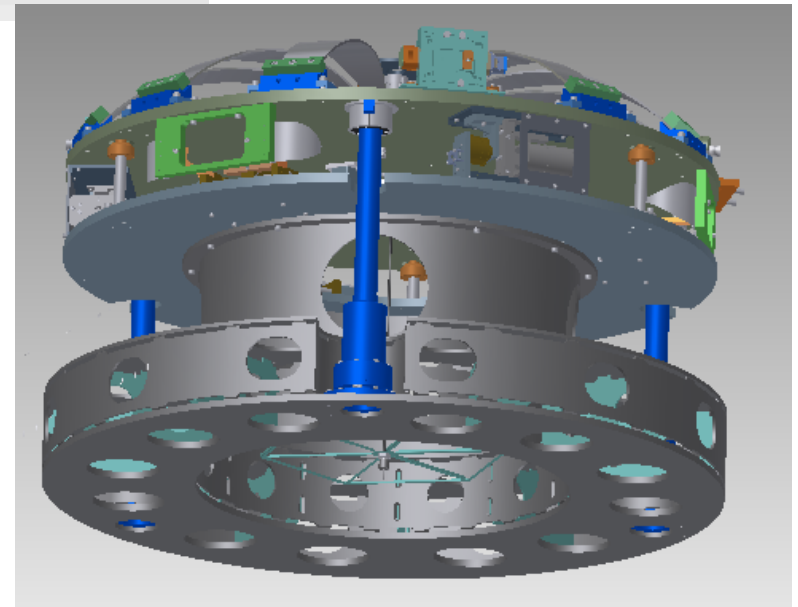


# Filter zero



Please consult  
T1100306-v1  
Top filter  
description

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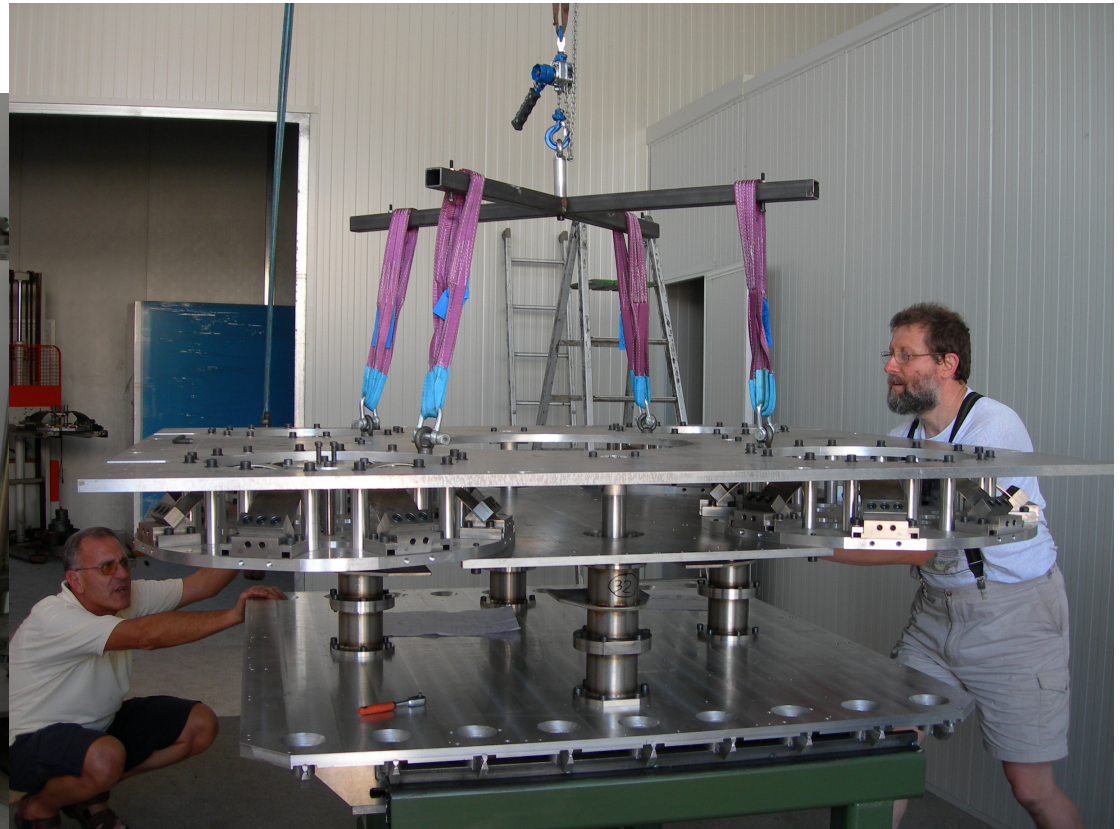


# Inverted pendulum

- Same as HAM SAS and AEI SAS

Please read LCGT-T1000253:

<http://gw.icrr.u-tokyo.ac.jp/cgi-bin/private/DocDB/ShowDocument?docid=253>

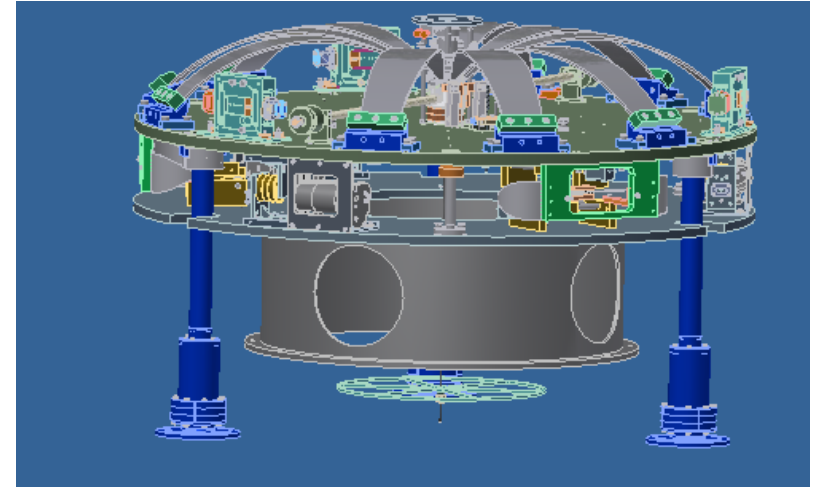
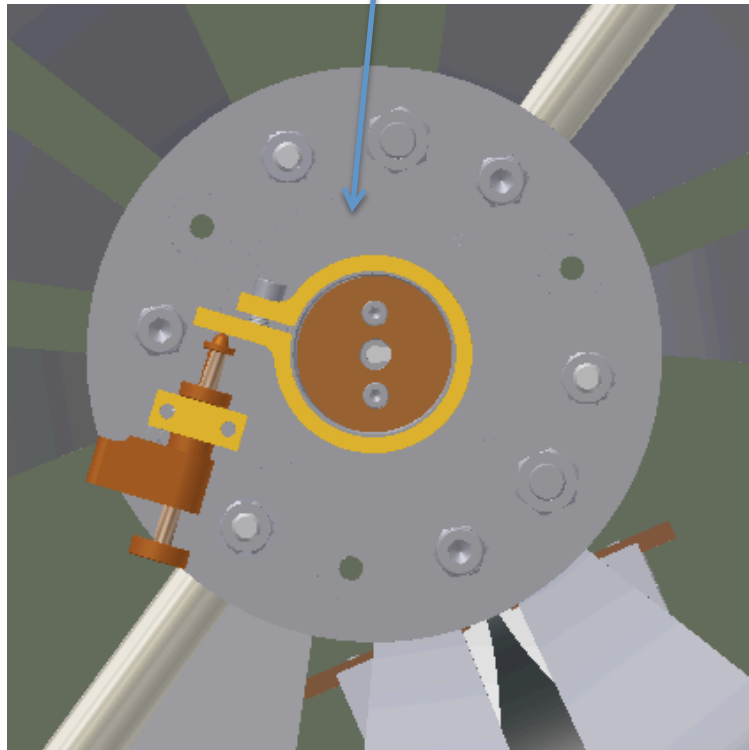


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# Filter zero functionalities

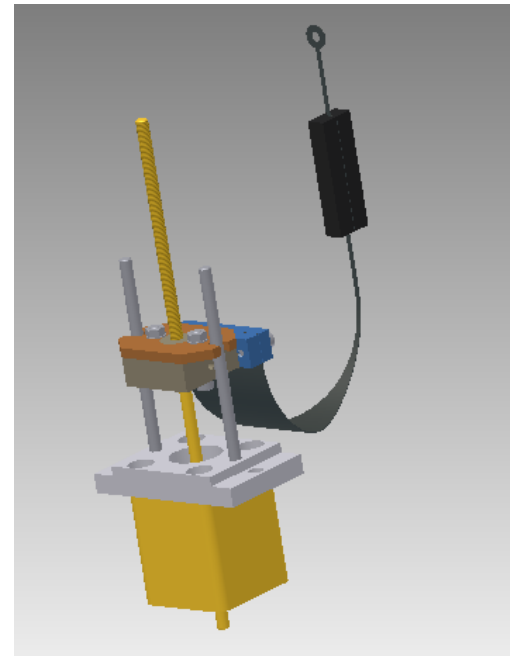
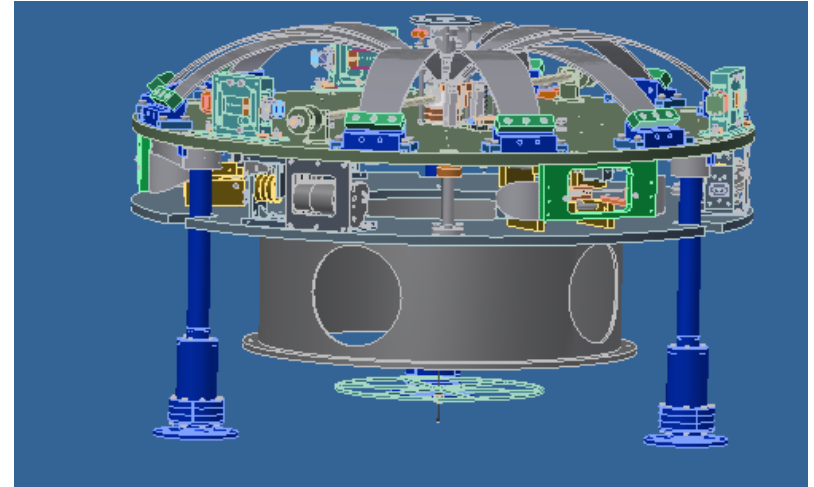
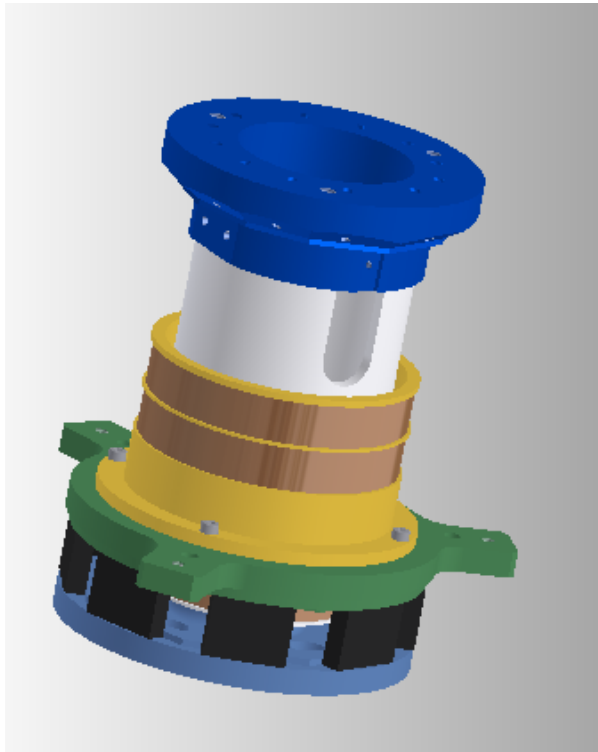
Tuneable load  
Rotatable suspension wire





# Filter zero functionalities

Dynamic and static positioning

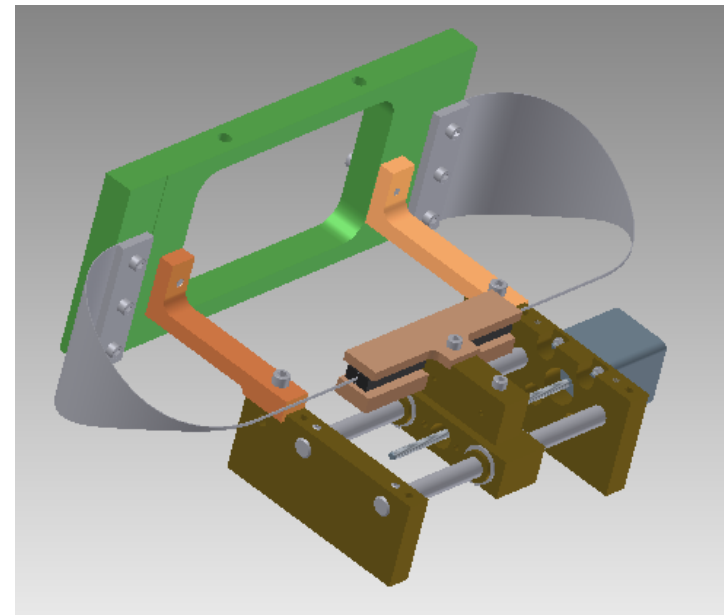
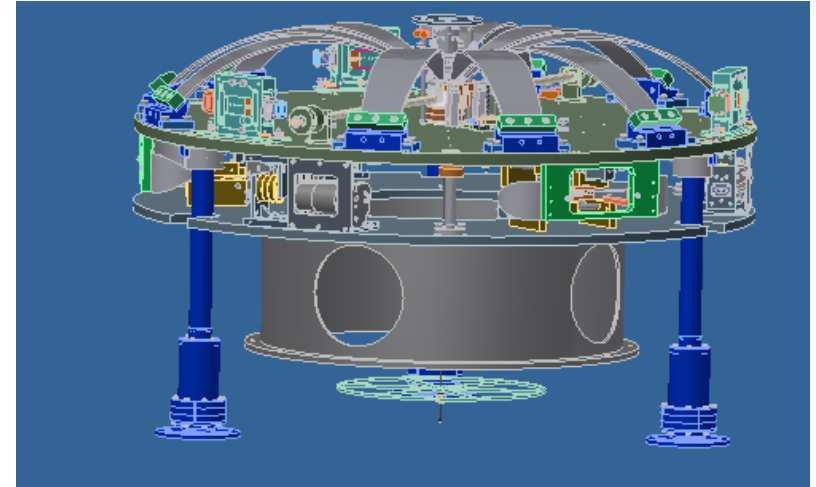
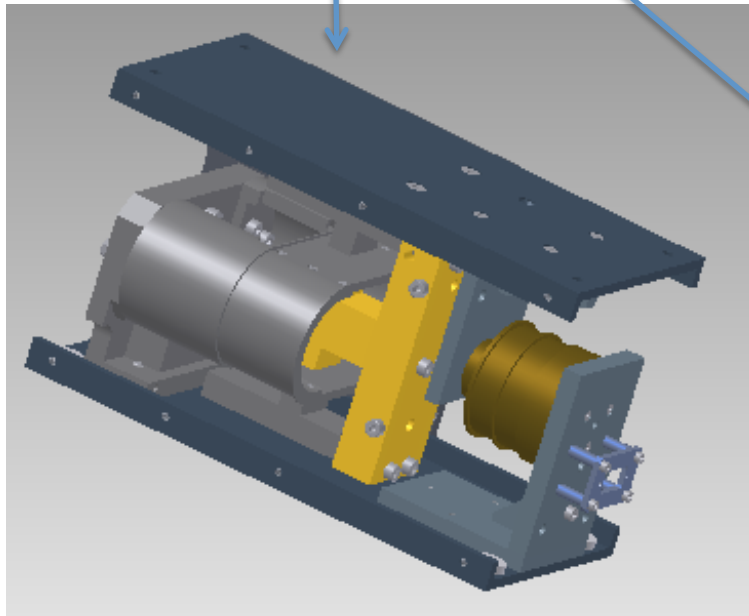


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# Filter zero functionalities

Dynamic and static positioning



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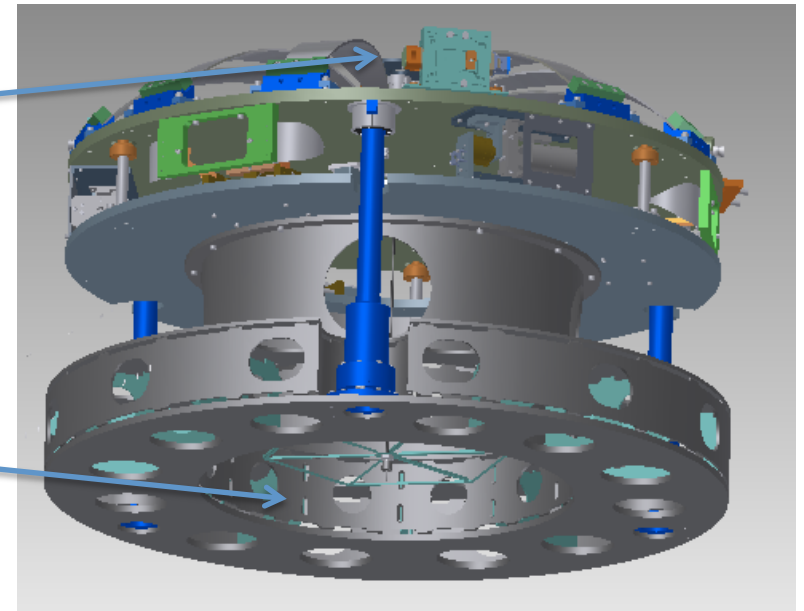
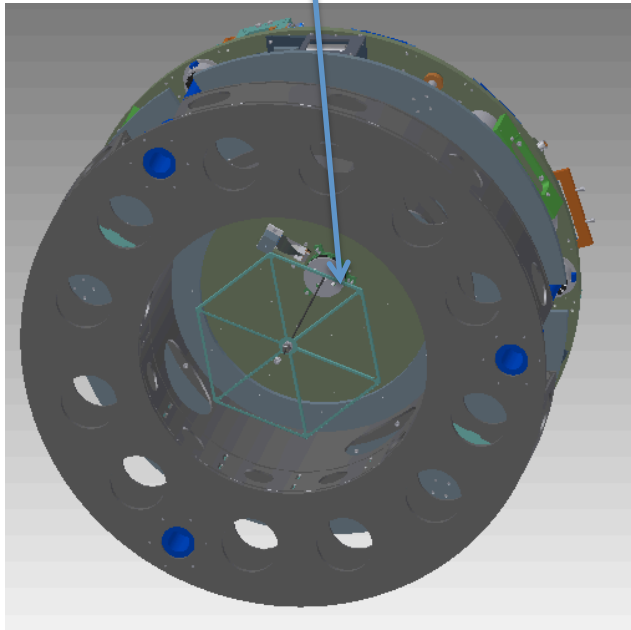




# Filter zero functionalities

Inertial control

Spider for cabling



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# Conclusions

- The first prototype of standard filter will be delivered to me in Lucca (Italy) this coming Monday and assembled
- Next week Takanori, Ryutaro and I will test it in NIKHEF, Netherlands
- Next we bring it here
- Design of the top filter nearing completion
- Prototyping will follow immediately
- Series production starting next fiscal year

Filter zero and  
Standard Filter  
Drawing set  
As of today  
D1100307-v2