

# KAGRAの防振系

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[共同利用(KAGRAのための低周波防振装置の研究)参加者]

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平成27年度東京大学宇宙線研  
共同利用研究成果発表会

東京大学柏キャンパス  
2015.12.18-19



# Configuration of vibration isolation system

Type-A: for cryogenic mirrors

Type-B: for room temperature mirrors

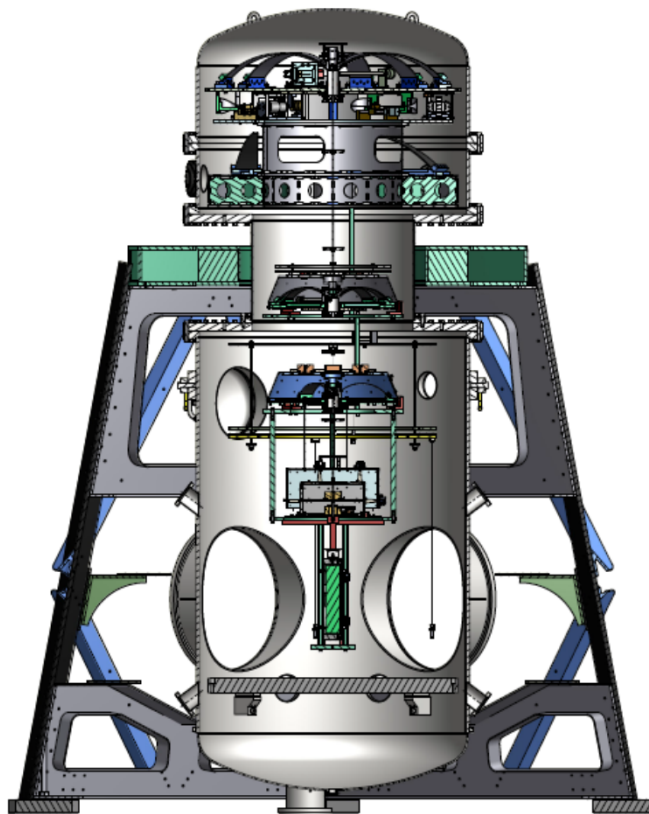
Type-Bp: simpler Type-B

Type-C: for small optics

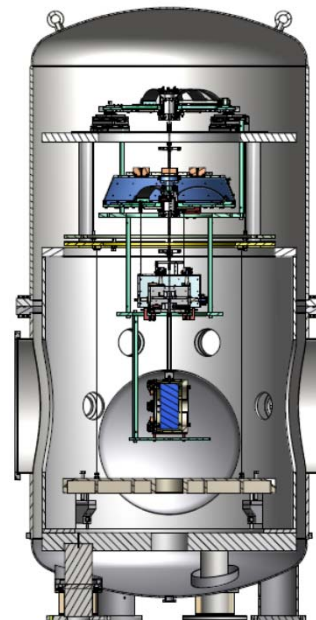
Type-A



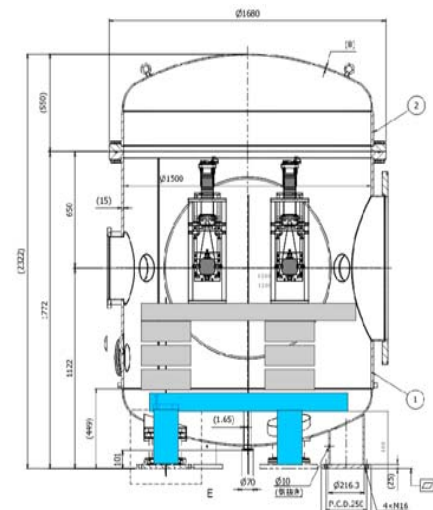
Type-B



Type-Bp



Type-C



# Seismic Attenuation System (Type-B)

Pre-isolator  
(PI)

Top Filter (TF)  
Inverted Pendulum (IP)

Filter chain

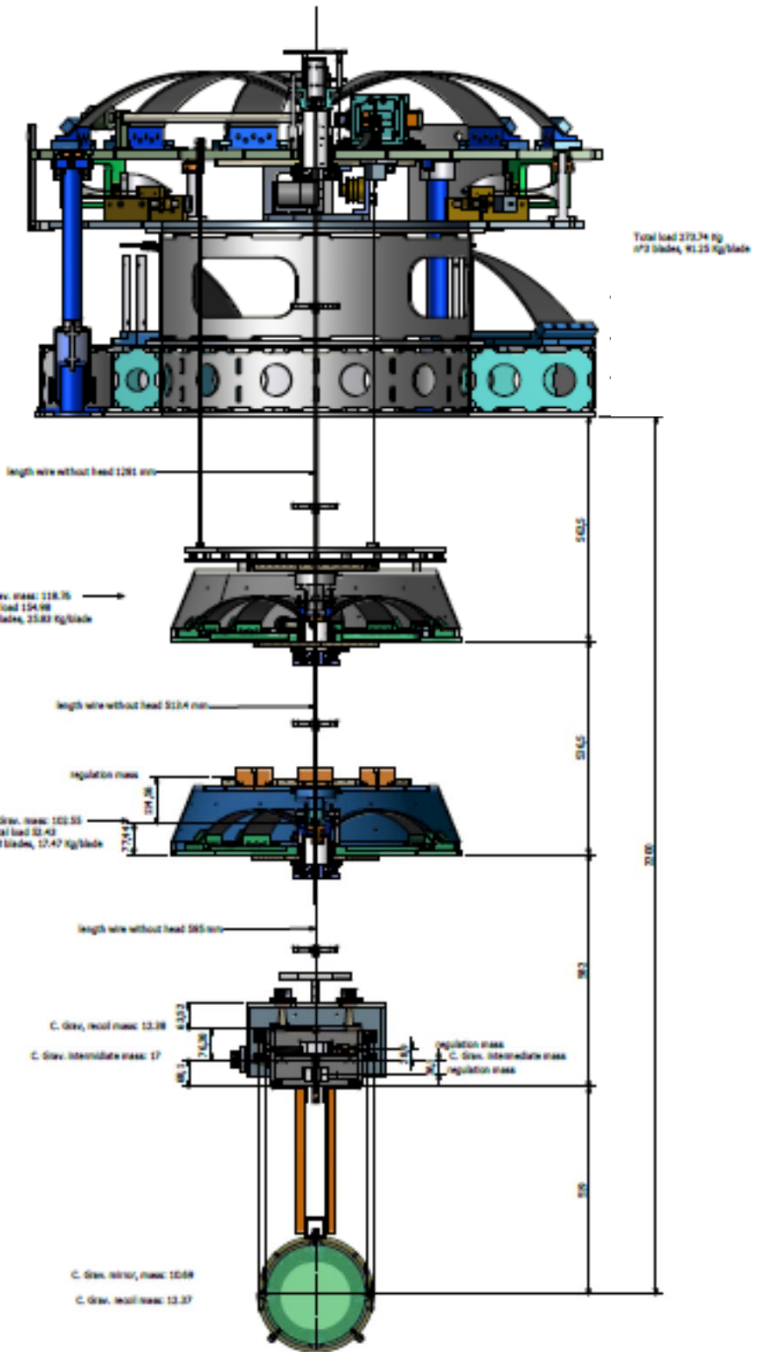
Standard Filter (SF)  
Filter1~3 in Type-A  
Filter1 in Type-B

Bottom Filter (BF)

Payload  
(PAY)

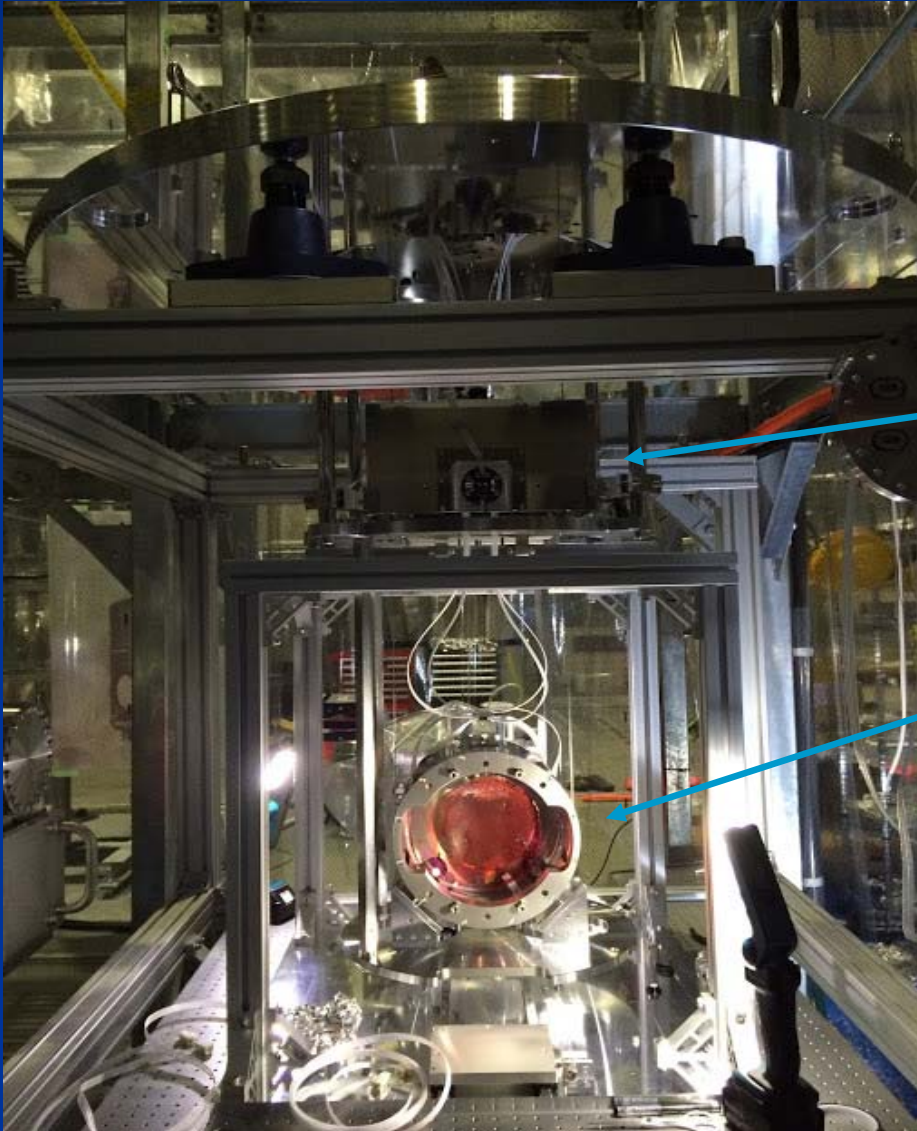
Intermediate Mass (IM)  
Intermediate Recoil Mass (IRM)

Test Mass (TM)  
Recoil Mass (RM)



## Configuration for iKAGRA

Type-Bp' systems are used for PR2, PR3, EXA, and EYA in iKAGRA.



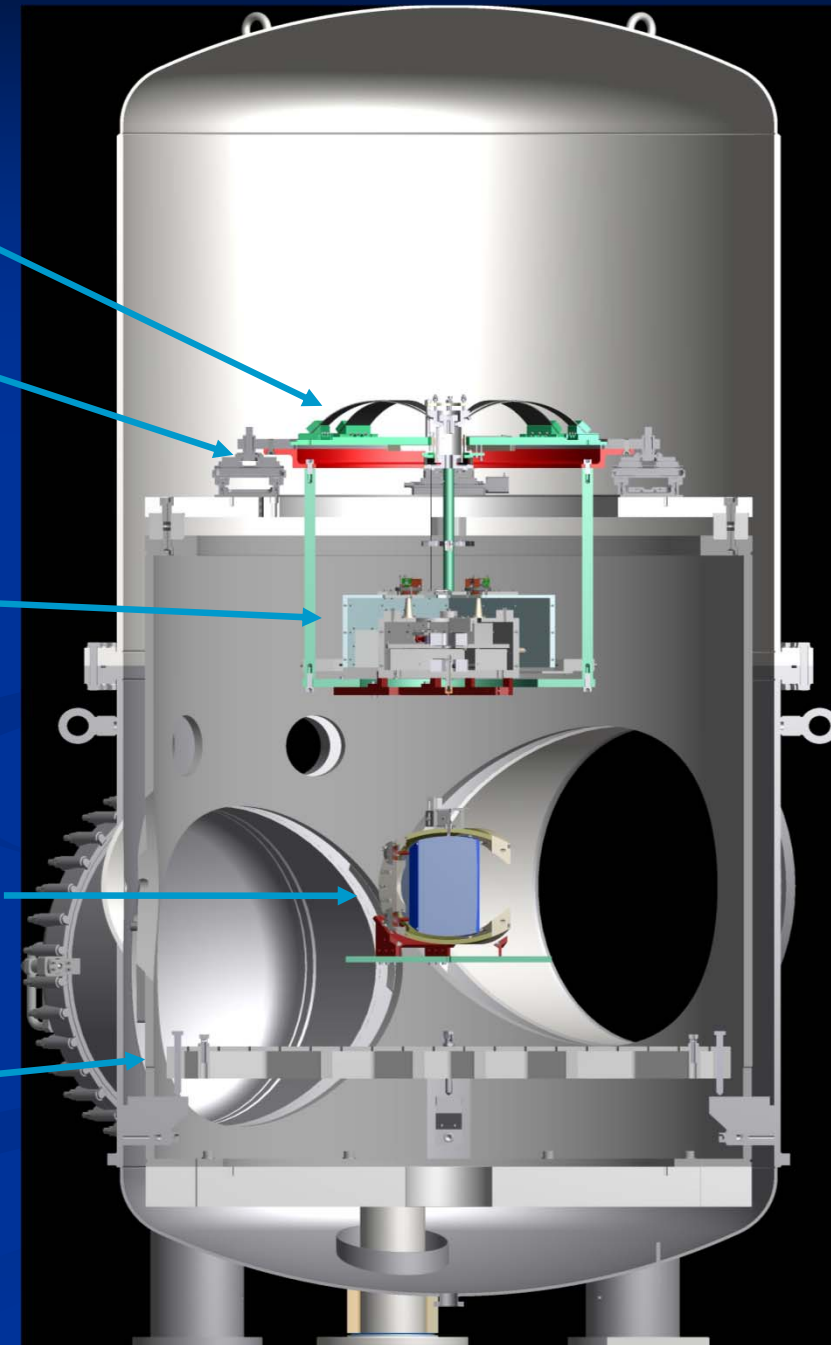
Bottom filter

Traverser

*Intermediate  
Mass &  
Intermediate  
Recoil Mass*

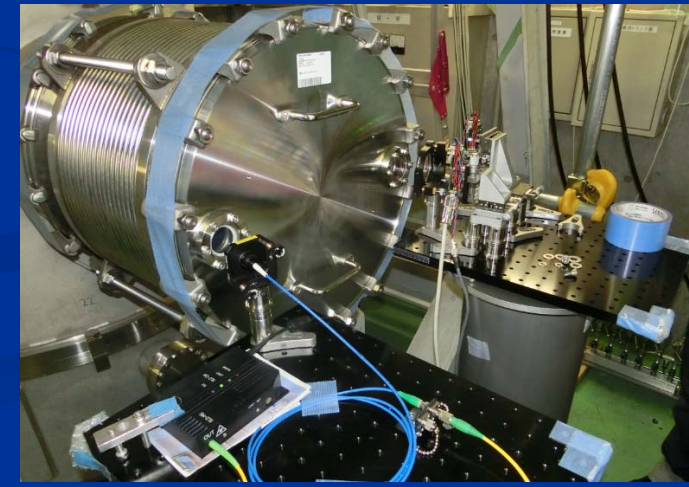
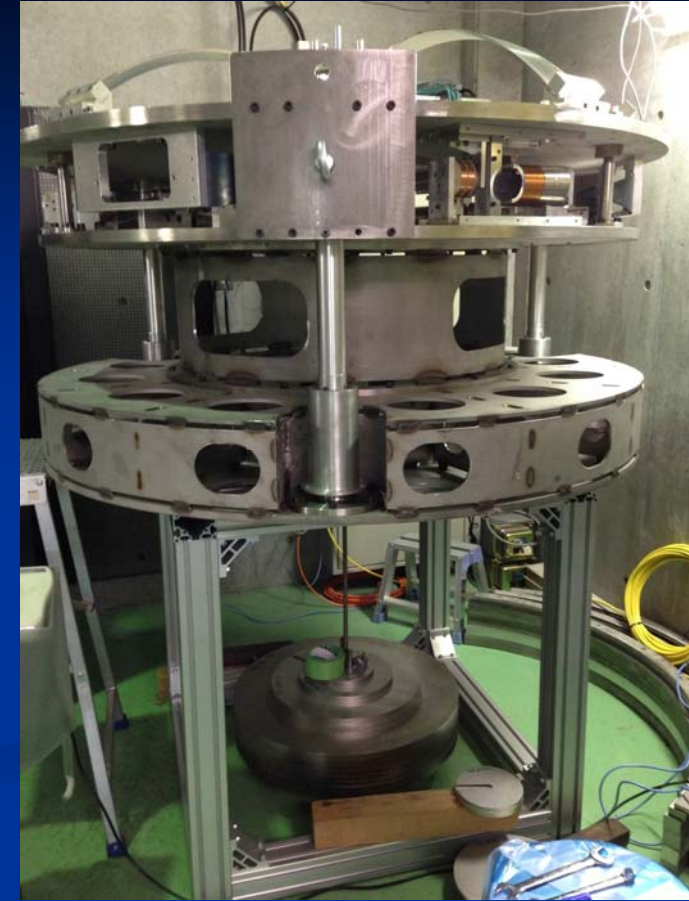
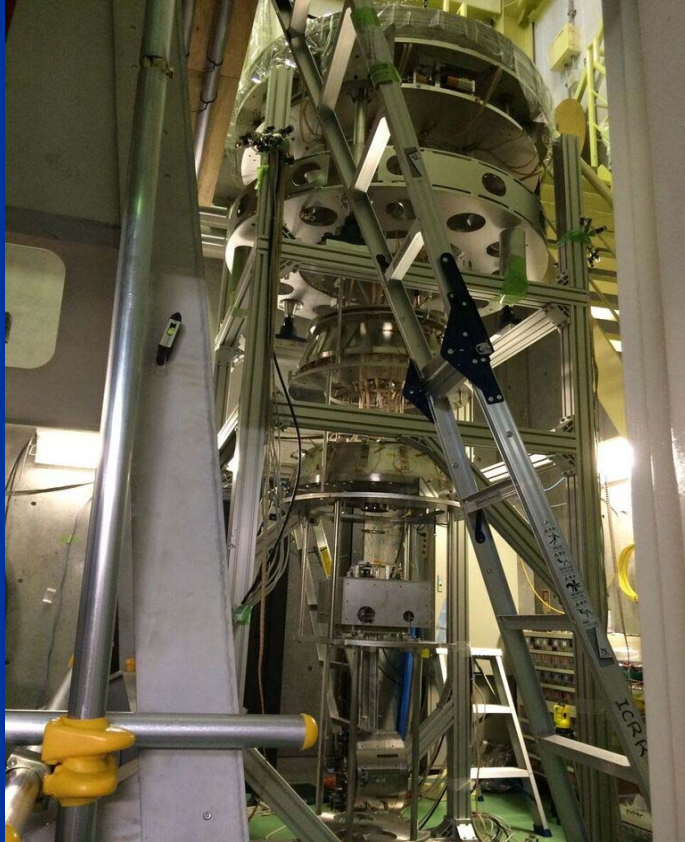
Test Mass &  
Recoil Mass

Bread Board



## R&D of full type-B system

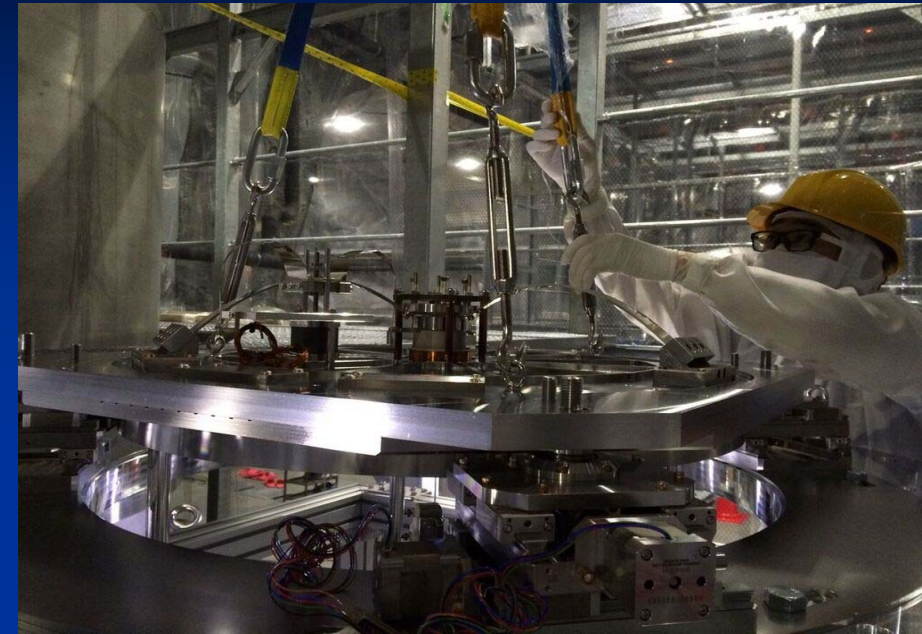
All of system was assembled with cabling by the side of the chamber. The full system was hung by a crane and installed into the chamber from the top. The system was working in vacuum.



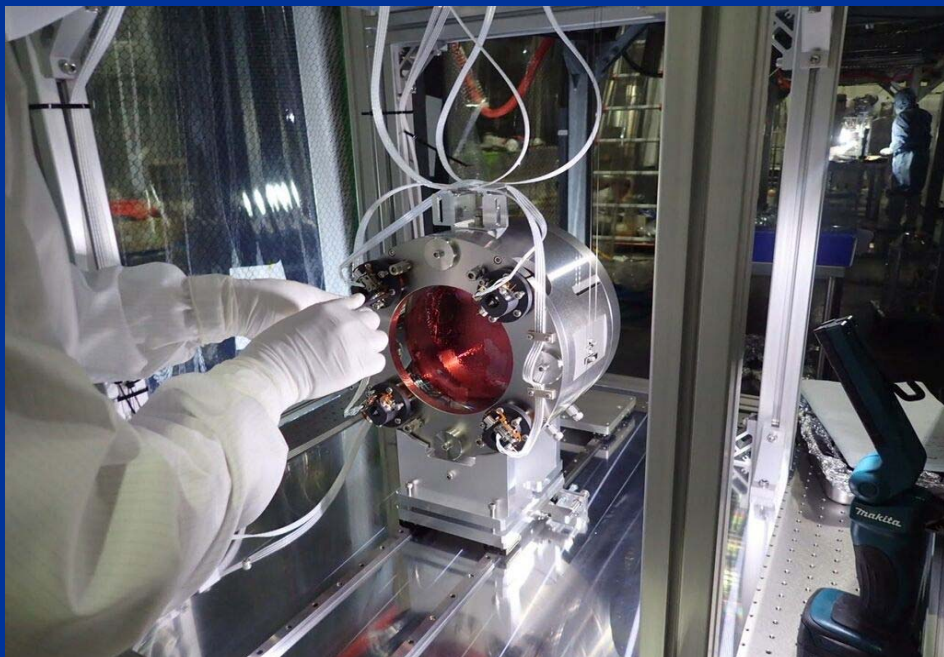
## Test assembly of VIS at the KAGRA site

Assembly of type-Bp' system for PR was started at the site using spare mirror.

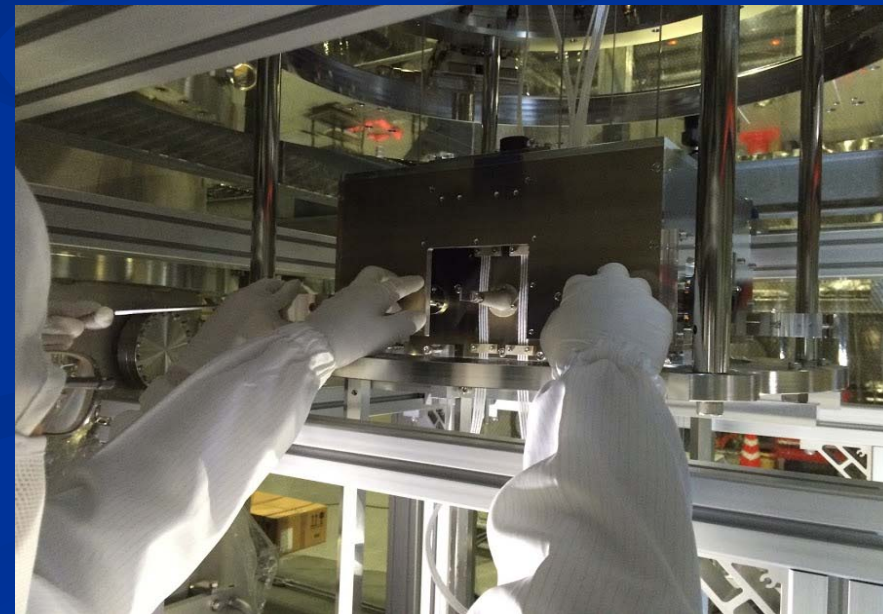
Hunging of mirror using the winch system



Setup of top stage (traverser)



Assembly of intermediate recoil mass



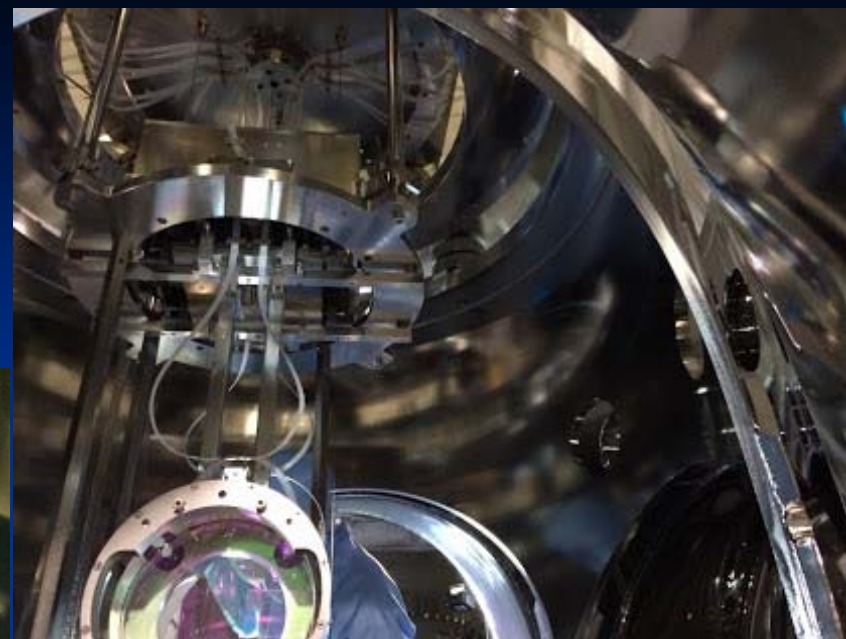
Adjustment of sensors on the recoil mass



Lift up of suspensions covered by clean bag from assembly frame



Checking of alignment



Suspension insalled into the vacuum chaber



Peeled "fast contact" from the mirror

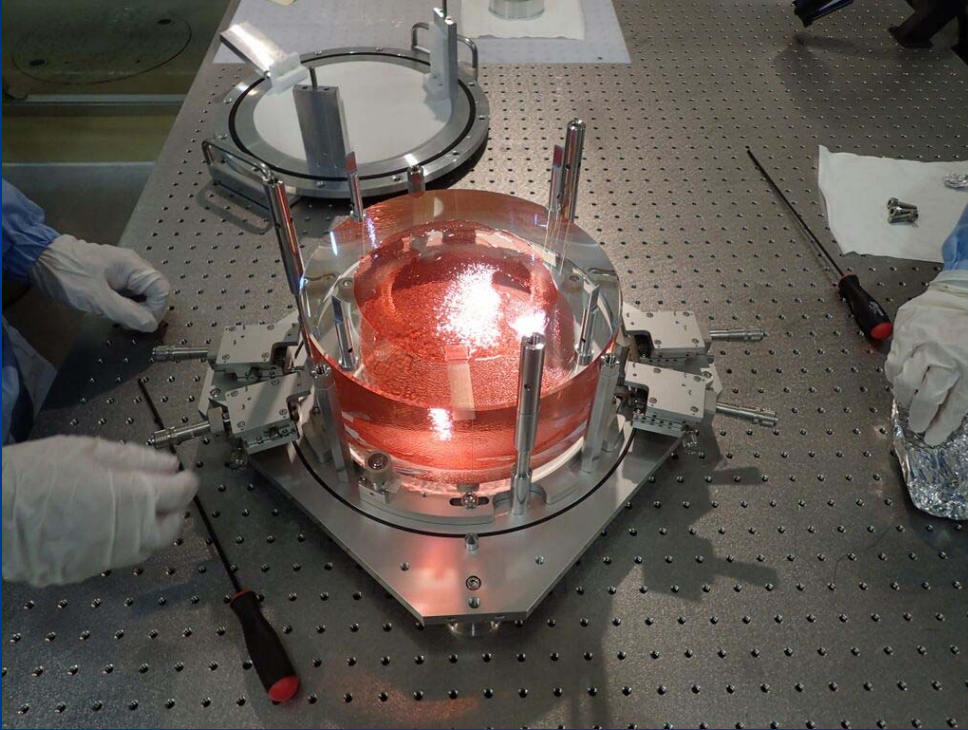
# Preparation Status

	Stack	Sus-pension	Top Filter	Inverted Pendulum	Standard Filter	Bottom Filter	Payload
Need	4	5	8	8	19	11	7
Existing	4	5	8	5	19	7	1
To be built	0	0	0	3	0	4	6

- 3 inverted pendulums will be produced by NIKHEF.
- 4 bottom filters will be assembled in the next year.
- 4 payloads are assembled at the site for iKAGRA.



# Preparation for TM and RM

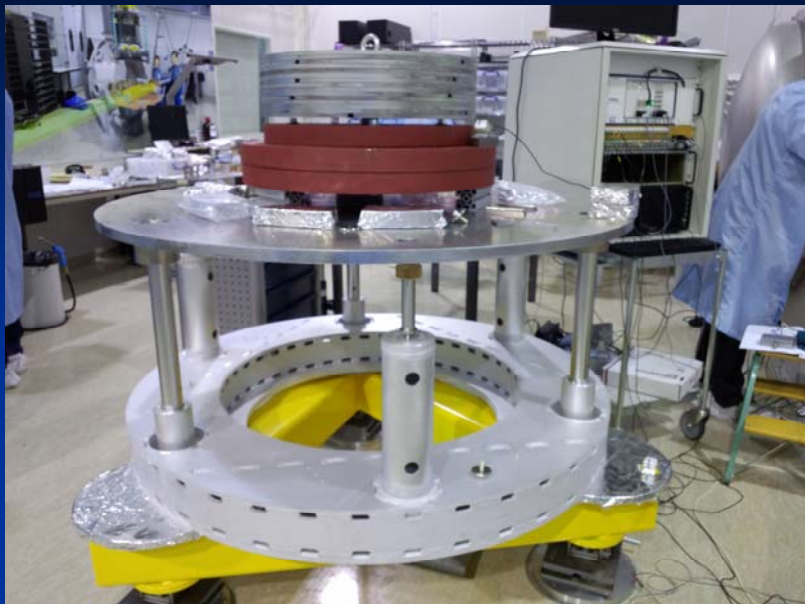


Assembly of the mirror (PR spare) in the class 1 clean room in ICRR

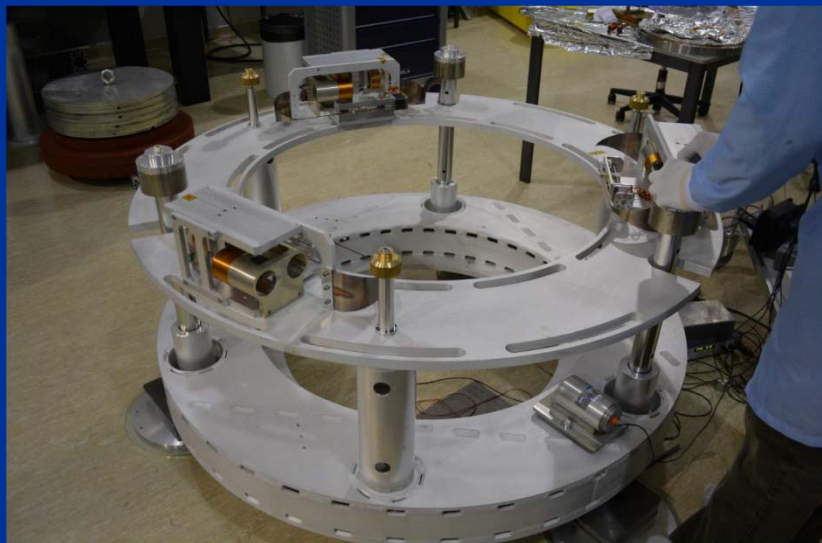


Pre-assembly of the recoil mass (Ti alloy) for BS

# Production of pre-isolators



Tuning of the inverted pendulum  
in NIKHEF



Mounting of the LVDT-actuator module in NIKHEF



Tuning of the top filter



Bending of the GAS blade

# Storage & Assembling in Akeno

- 16 Standard filters
- 5 Top filters
- 4 Inverted pendulums
- 3 Earthquake stops

