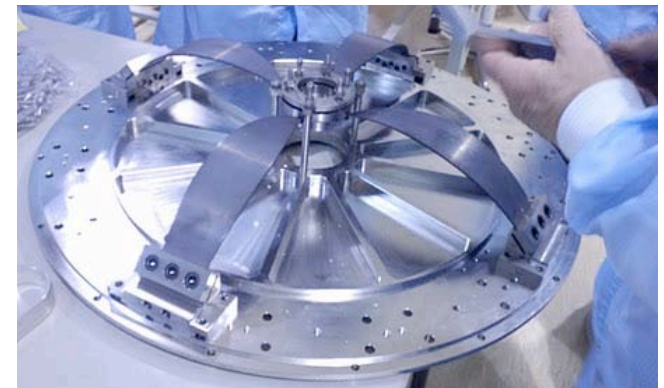
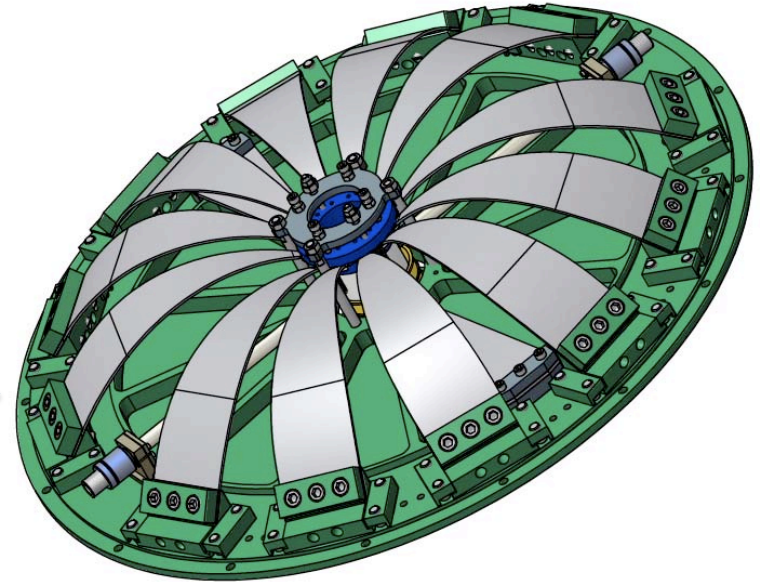


# LCGT Seismic attenuation Present Status

R. DeSalvo, H. Ishizaki, E. Majorana,  
T. Sekiguchi, R. Takahashi,  
A. Takamori, T. Uchiyama, K. Yamamoto

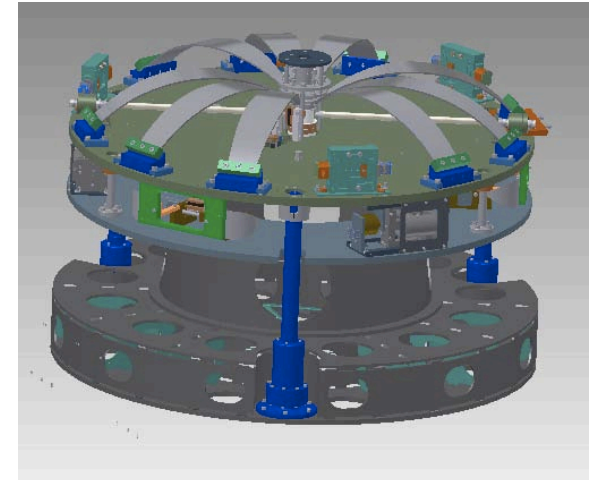
# LCGT standard filter

- Last time the **standard filter** went from a design:
- To a prototype
- Tested at NIKHEF
- Now under test in the basement at Kashiwa



# Inverted pendulum-Top Filter

- We went from a design

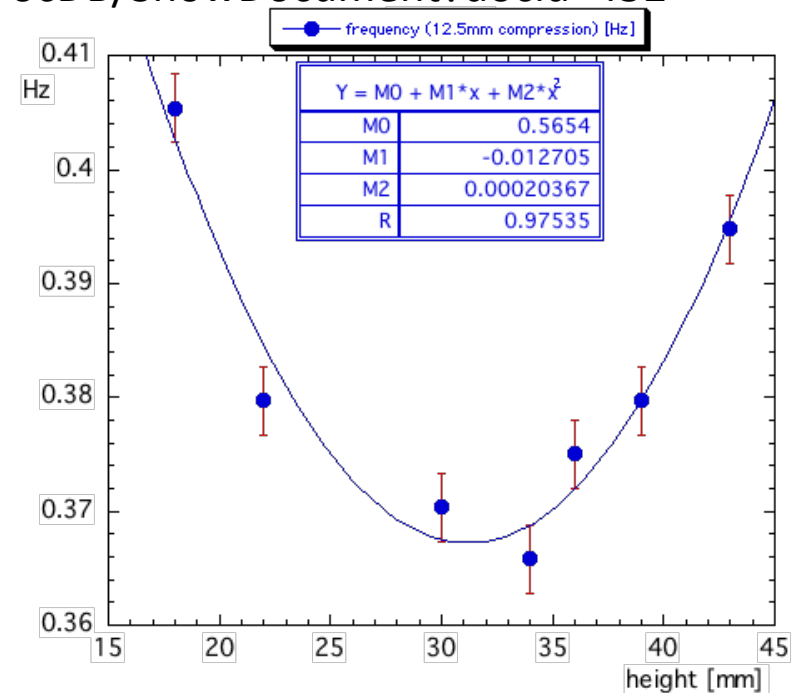


- To a prototype



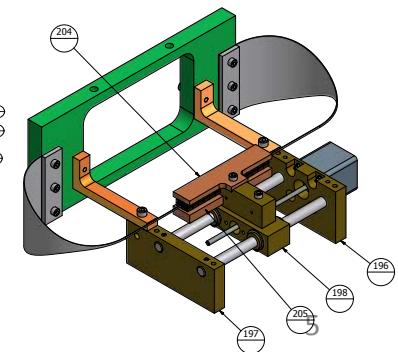
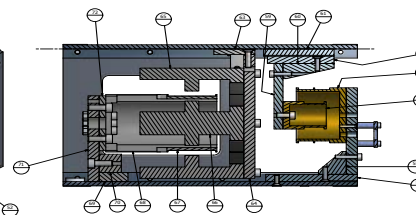
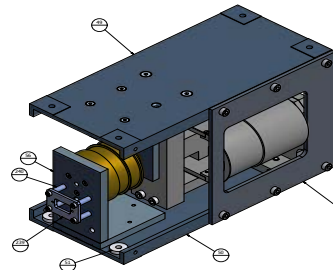
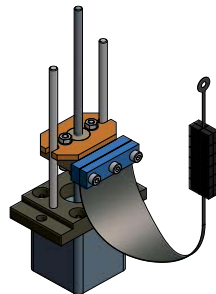
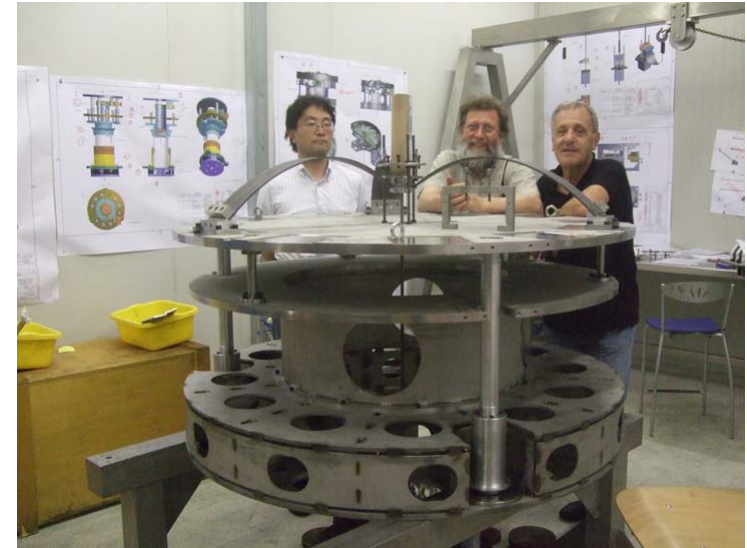
# Top Filter / Inverted Pendulum

- Very preliminary tests at G&M
- For more detail please see:
- <http://gw.icrr.u-tokyo.ac.jp/cgi-bin/private/DocDB/ShowDocument?docid=452>



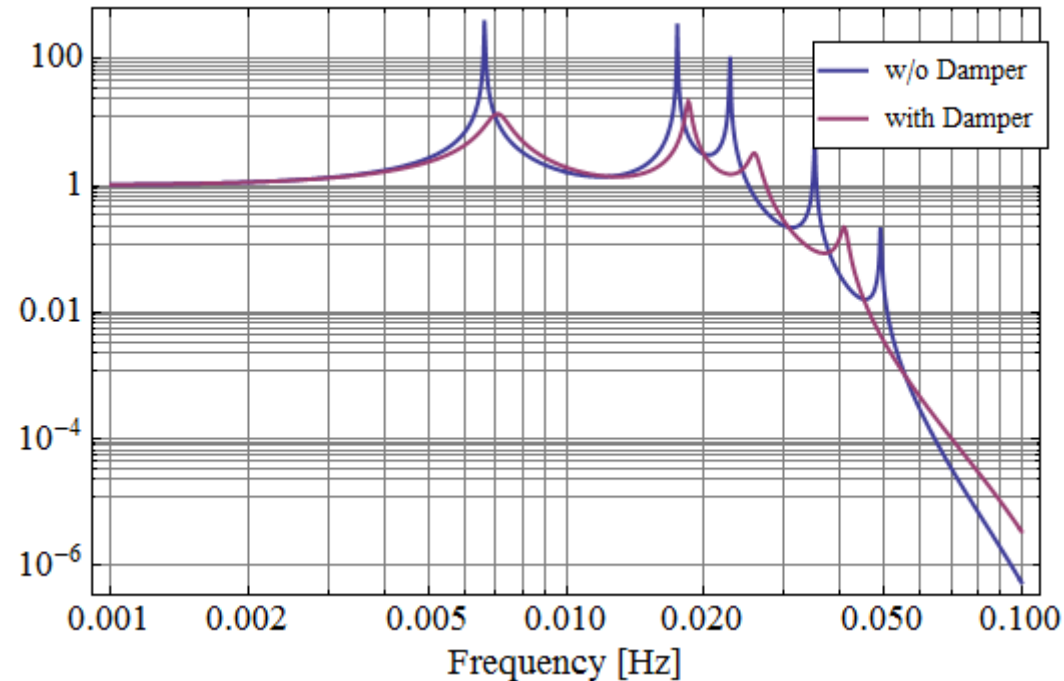
# Top Filter / Inverted Pendulum

- Now installing
  - LVDT,
  - voice coil actuators,
  - stepper motor springs
- Then shipping to Kashiwa



# Simulations: Yaw motion

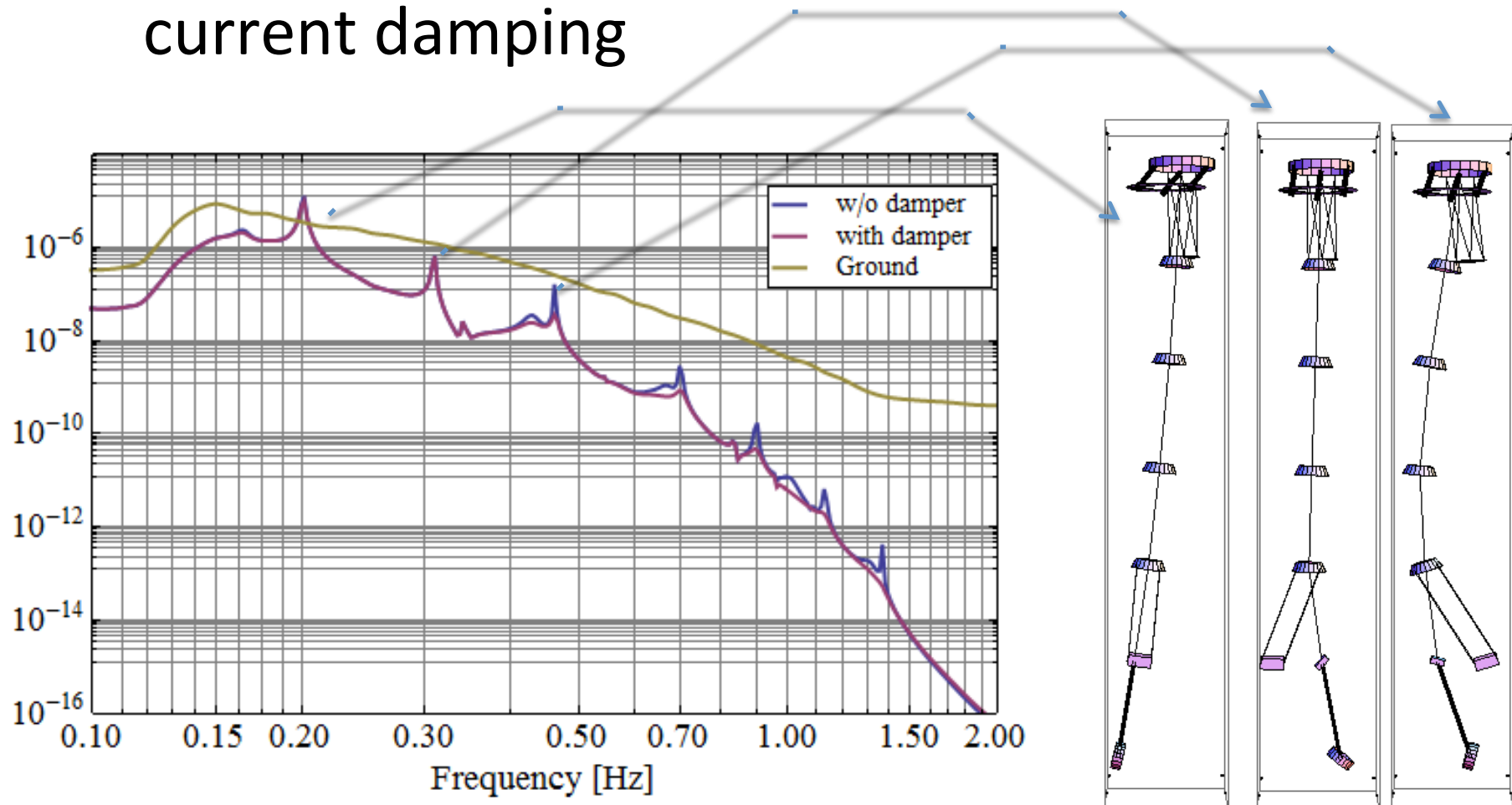
- The transfer function from ground yaw motion to TM yaw motion shows:
- Good damping can be achieved





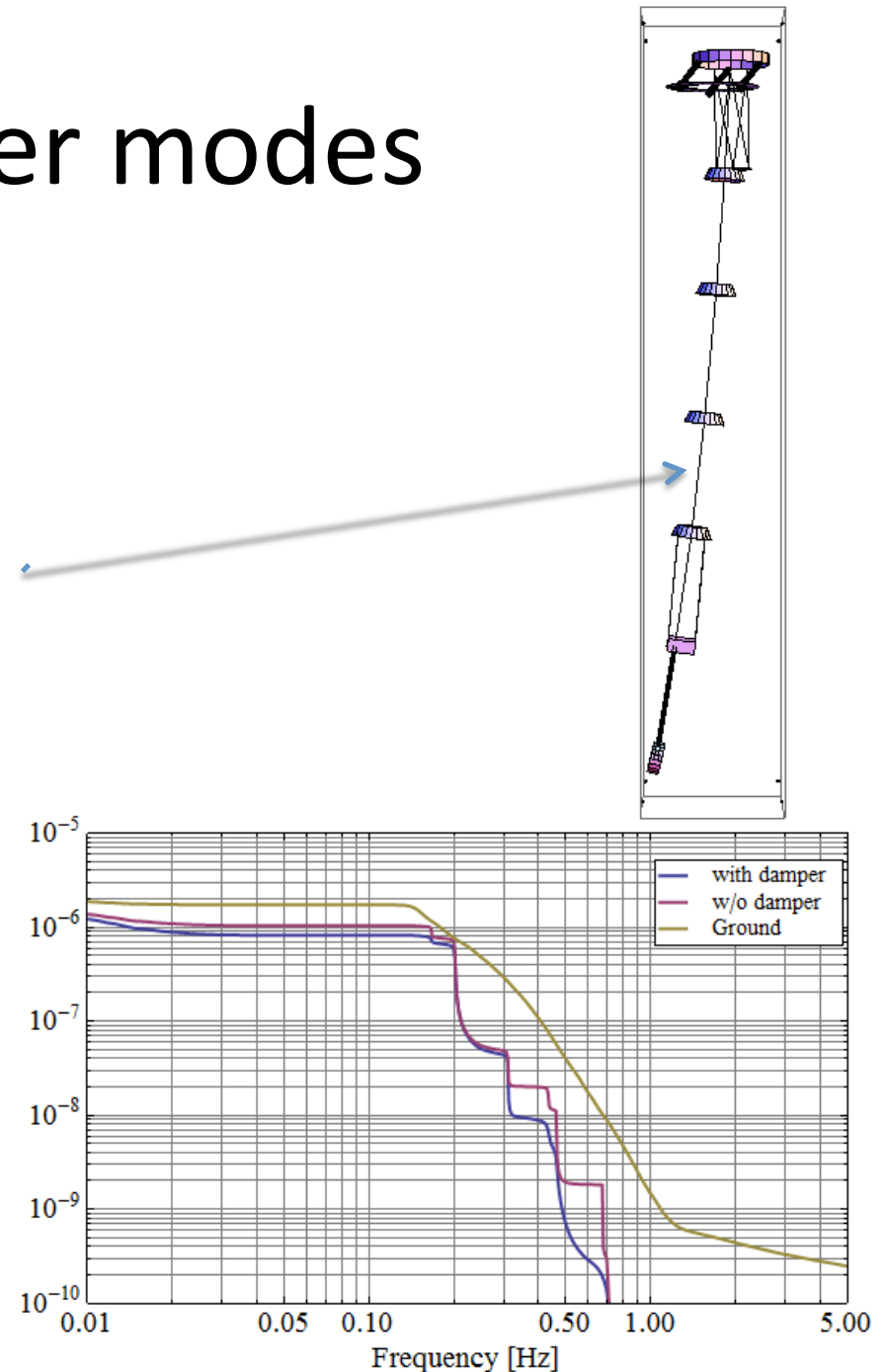
# Simulation: Transversal modes

- seismic noise level of TM, with/without eddy current damping



# Damping of lower modes

- Active damping for RMS amplitude reduction
  - try using shadowmeter signal
  - Otherwise accelerometer signal
- For easier lock acquisition

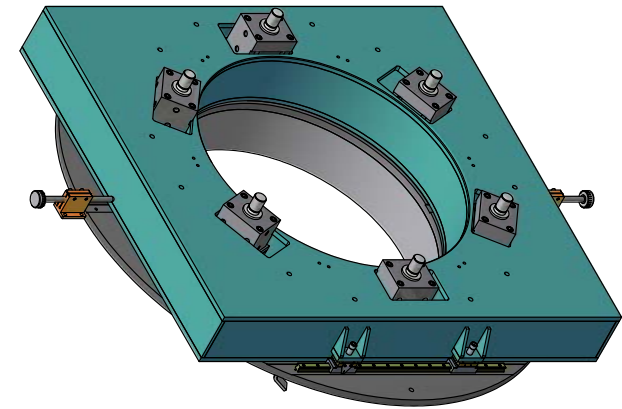




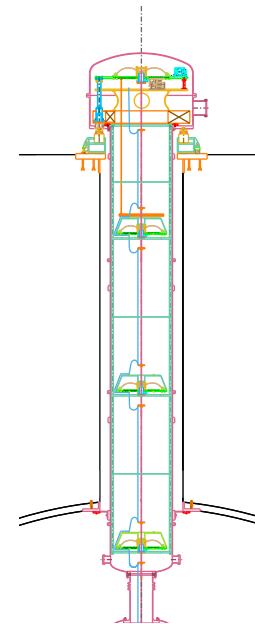
# Presently under Development

- Inverted pendulum support structure

- Top of type A
- Top of type B



- Cabling
- Safety structure
- Installation procedure down the well



# What will be achieved

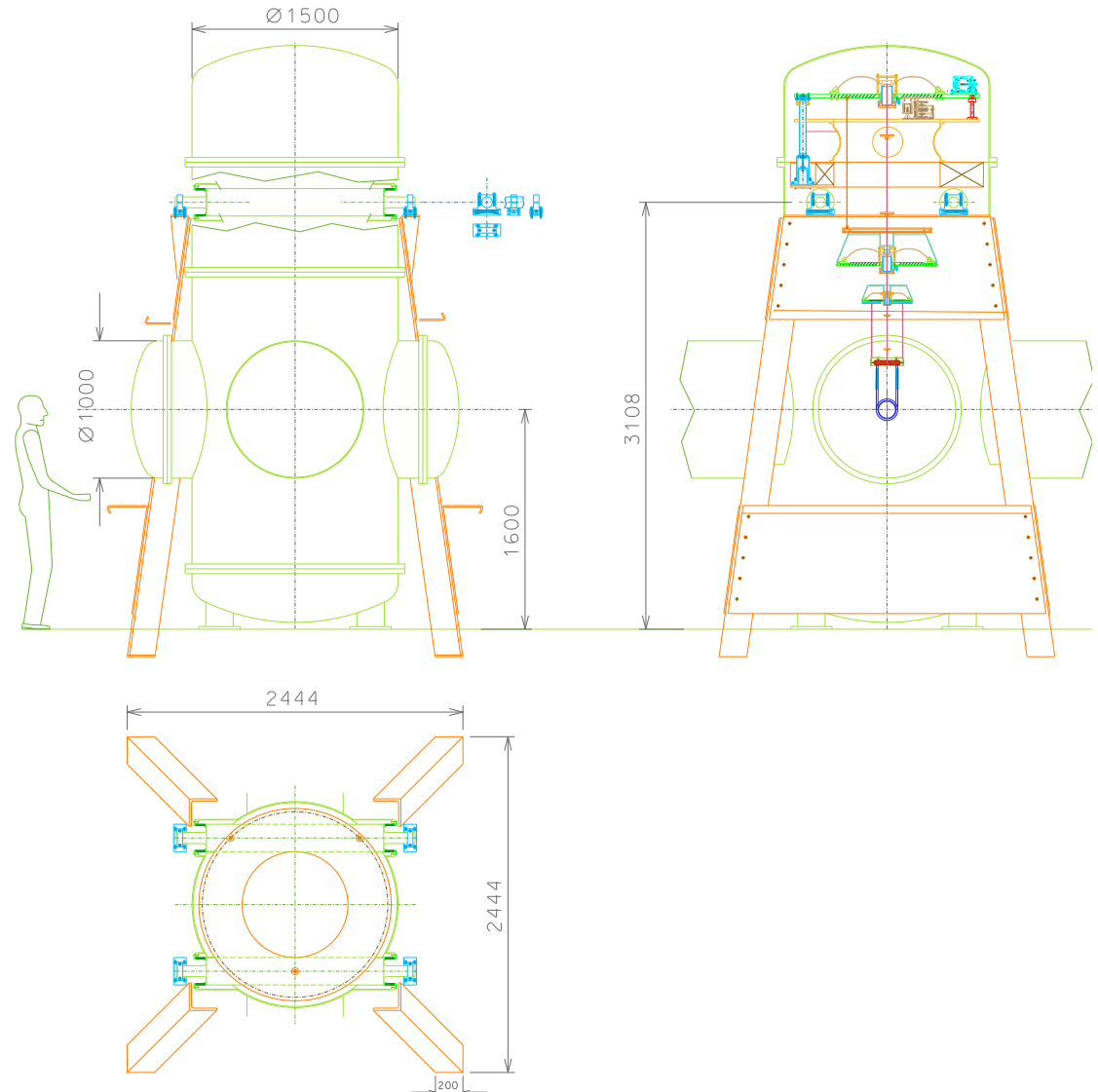
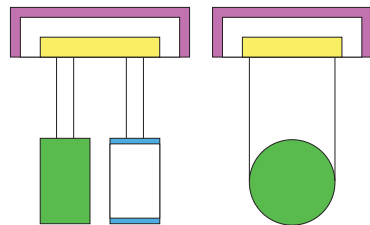
- All construction blocks for the LCGT seismic attenuation will have been prototyped
- Type A seismic attenuation designed

# To do

- Intensive performance tests at Kashiwa
- Validation of simulations
- Evaluate cabling performance degradation
- Start simulating controls

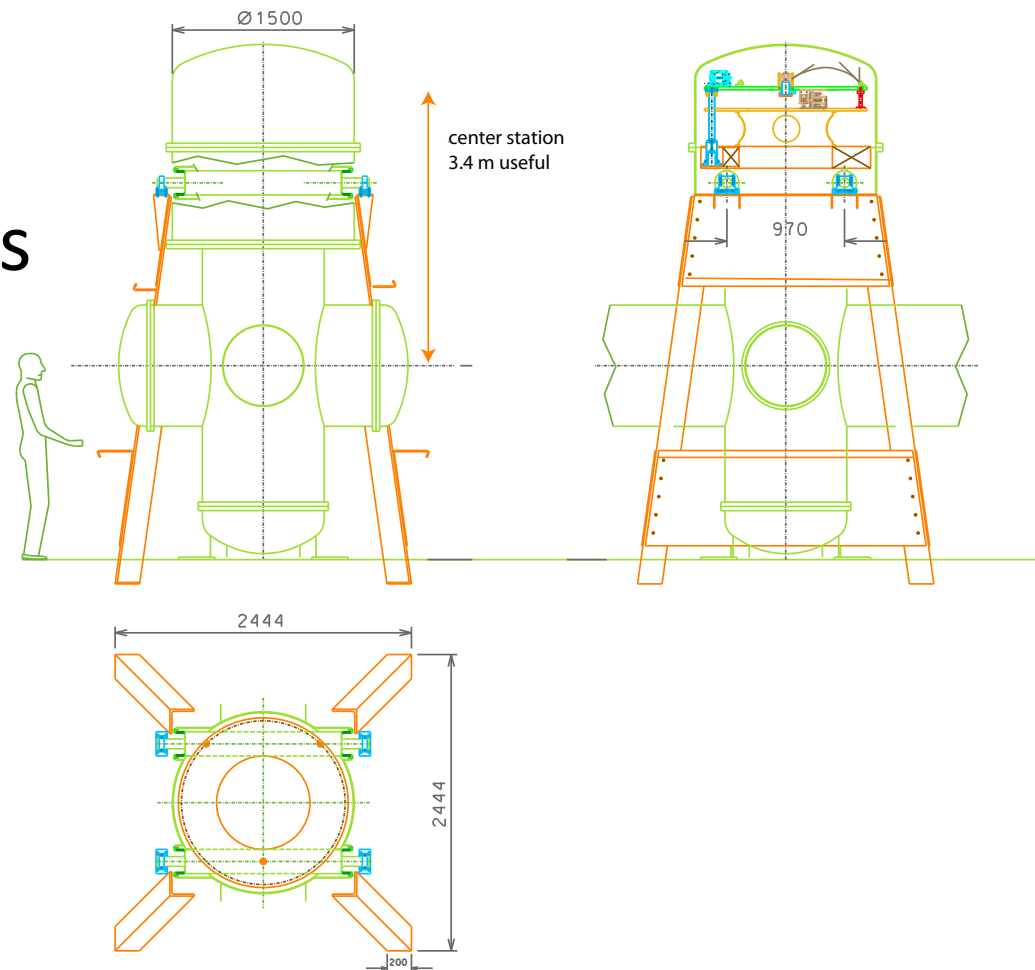
# What next

- Design of type-B
- Inverted pendulum table on space frame surrounding vacuum chamber
- Type B payload



# What next

- Adapt design for tests with TAMA vacuum chambers



# And then . . . .

- Return to payload design for i-LCGT
- Interface with cryogenics

