

# Cryogenics : Cryostat assembling and performance test



Dressing partition of  
No.1 Cryostat



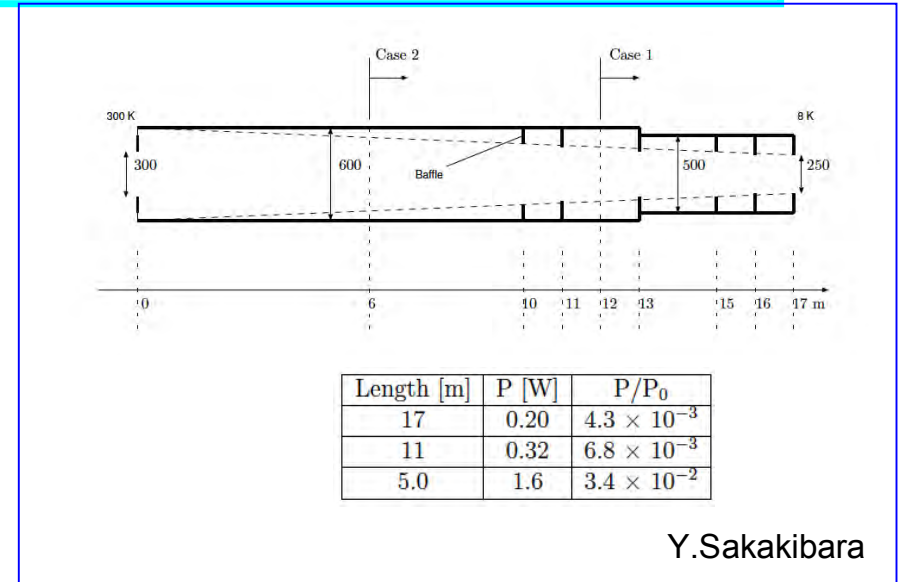
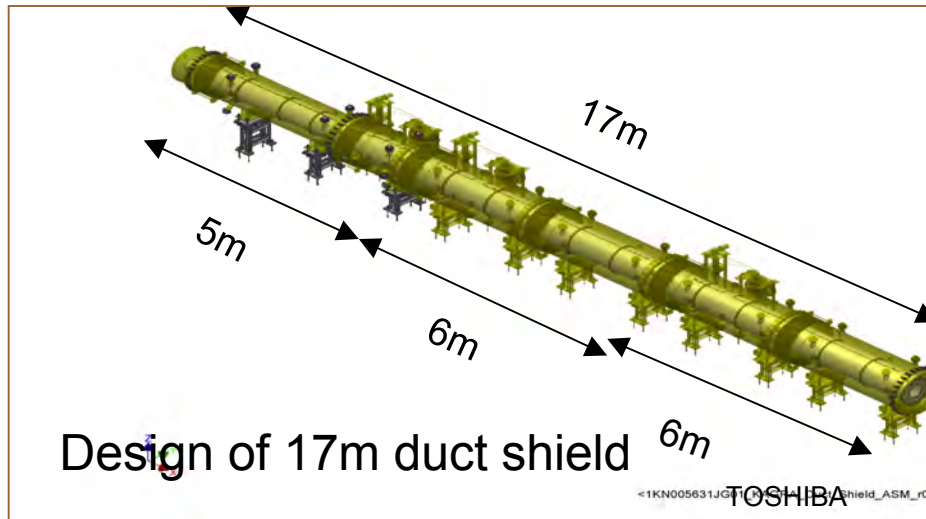
Ceiling part of 8K shield



Al sphere for an initial cooling  
test of mirror suspension

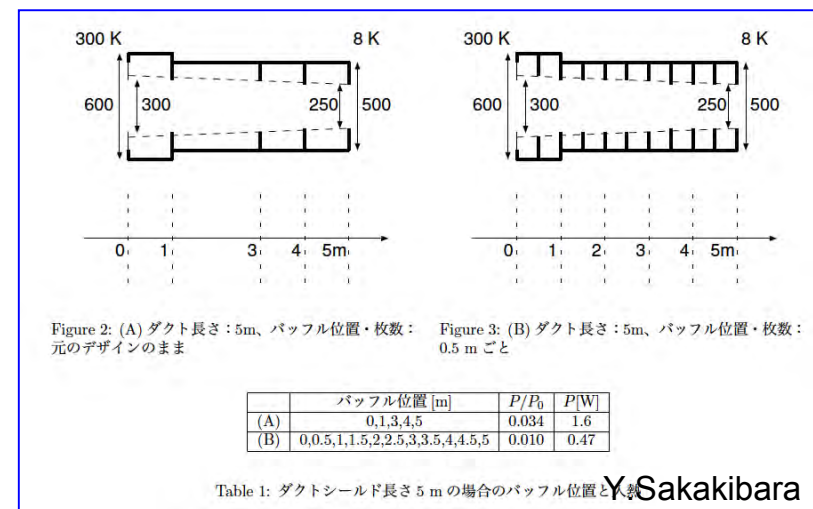
- Assembling of cryostats and preparation of performance tests are in progress in the TOSHIBA Keihin Factory.
- Basic test items
  - Cooling time, minimum attainable temperature under various heat loads.
- Specific test items
  - Cryostat No.1 : Cooling test of  $\phi 105$  Al sphere without DLC.
  - Cryostat No.2 : Cooling test of  $\phi 105$  Al sphere with DLC.
  - Cryostat No.3 : Vibration measurement of 8K shield using interferometer(ICRR) and accelerometer(Roma Univ.)
  - Cryostat No.4 : Cooling test of a scaled preliminary model of cryogenic payload.

# Cryogenics : Duct shield (17m vacuum duct + cryo-pipe)

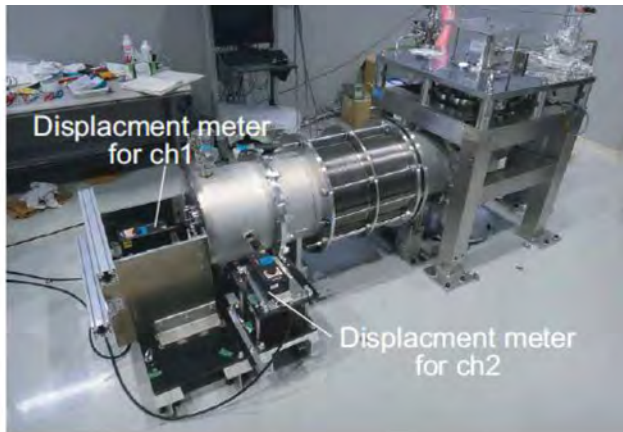


## ↓ Investigation of shorter cryo-pipe

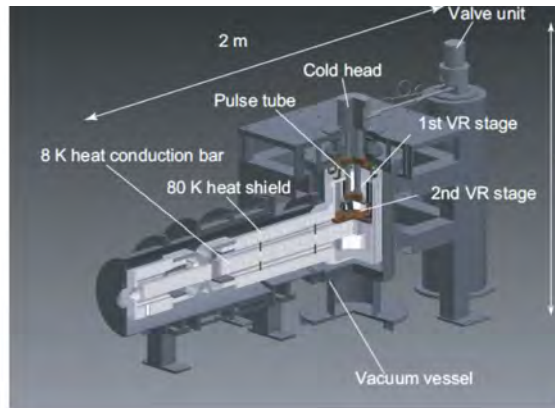
- Duct shield has been designed with 17m vacuum duct and 17m cryo-pipe.
- One set of 17m duct shield is manufactured by TOSHIBA in 2012-2013.
- An investigation for shorter cryo-pipe is started by the requirement of cost reduction.



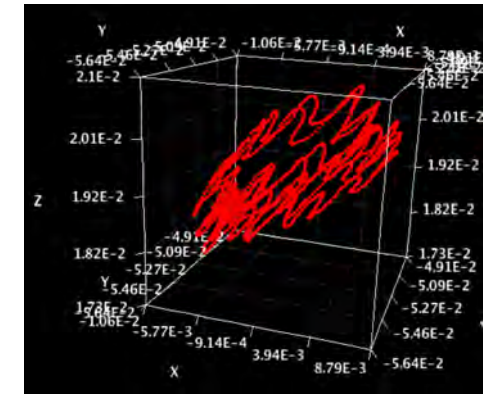
# Cryogenics: 4K cryocooler unit



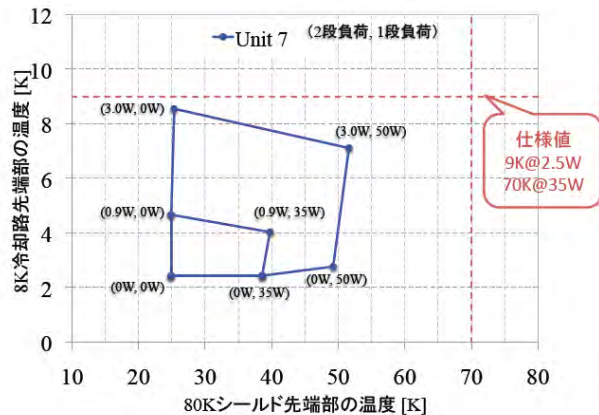
4K cryocooler unit and set of displacement meter.



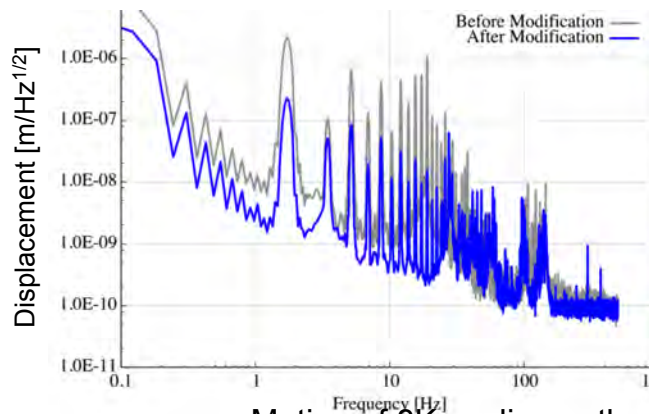
Inner structure of cryocooler unit.



3D plot of 8K cooling path. Voltage to displacement conversion factor is  $10^{-5}$  m/V. Moving average of 0.2 sec was applied.



Load map of cryocooler. (C.Tokoku, 2012 Nov. CSJ)



Motion of 8K cooling path.

- 4K cryocooler units with vibration reduction mechanism are manufacturing.
  - 5 units in 2011FY and 9 units in 2012FY.
- Cooling power of the cryocooler satisfied the requirement.
- Vibration level was improved by a reinforcement of support structure.