

KAGRA Cryogenics

Cryostat
Cryocooler Unit
Shield Duct
Cryogenic Payload

2012.04.16

Domestic Meeting
ICRR Kashiwanoha

Cryostat

2012 Mar. 30

Inspection and receiving.

FY. 2012

Successful bidder : Toshiba

Assembling of cryostats.

Performance test of cryostats.

Manufacture a shield duct by way of experiment.

Immediate issues

Select a window material

Fix number of wires through cryostat wall



4K Cryolooer Unit

2012 Mar.

Inspection and receiving for 7 units.

FY. 2012

Successful bidder : JeccTorisha

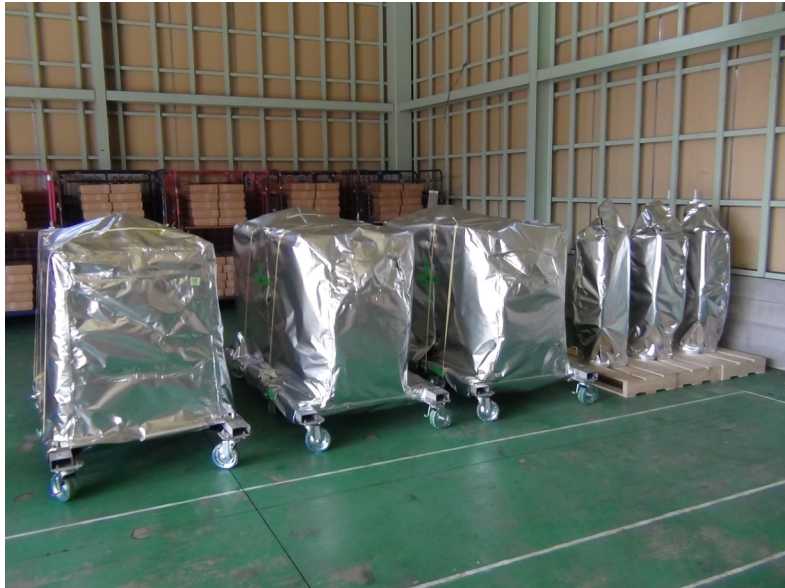
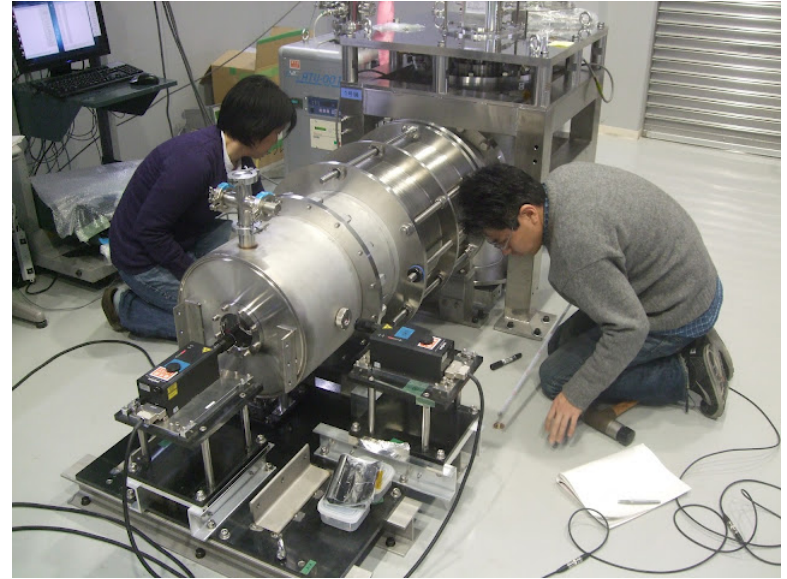
Manufacture 9 units.

Performance test.

Lend 8 units to Toshiba for test of cryostats.

Immediate issues

Reinforcement of VRS and supporting post of cooling paths.



Cryocoolers

2012 Mar.

Inspection and receiving

9 of 4K cryocoolers from SHI

2 of 50K cryocoolers from JAW

Storage : Kashiwa Lab.

Shield Duct

FY. 2012

Design continuation with Toshiba.

Manufacture one set with single stage PTCs.

Immediate issues.

Tolerable temperature distribution.

Balance of thermal resistance distribution and configuration of PTCs.

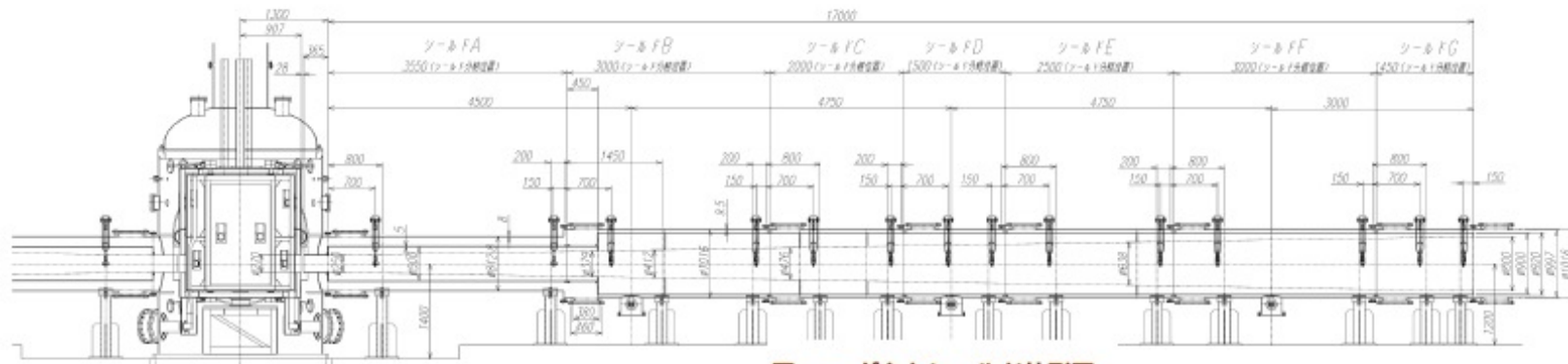


図4.1 ダクトシールド外形図

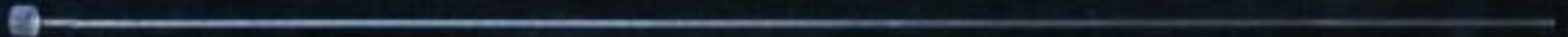
Cryogenic payload

(1) Sapphire fibers

Fibers with thick end

Sapphire fibers to suspend sapphire mirrors

4 sapphire fibers from MolTech GmbH (Germany)



Length = 350 mm diameter = 1.8 mm

Almost as needed in bKAGRA.

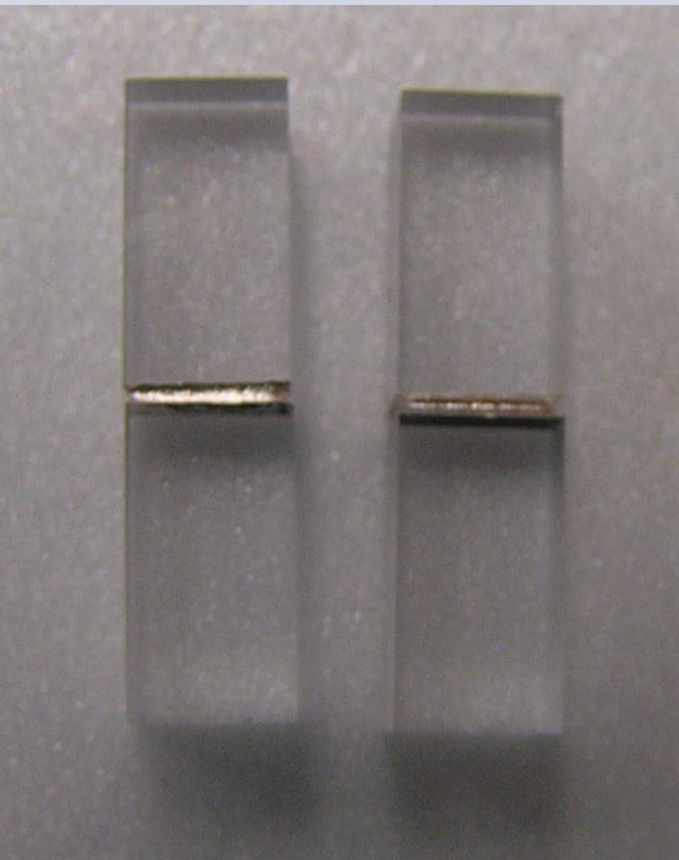
Need to check the quality.

Cryogenic payload

(1) Sapphire fibers

Fiber polishing : Kyocera, Namiki

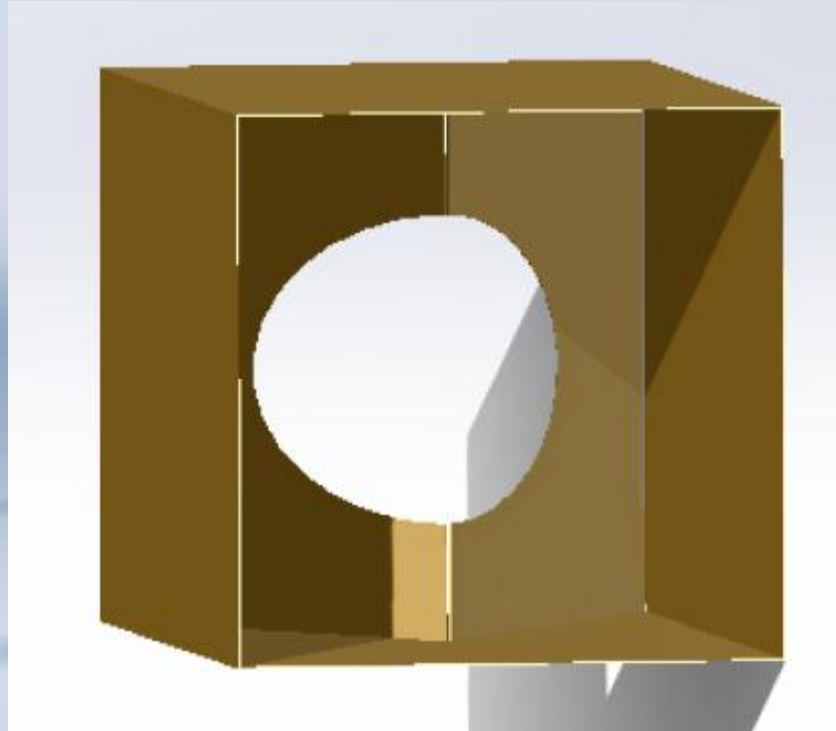
Metalize Bonding : Kyocera
Sample arrived.



Metalize bonding (Kyocera)

Cryogenic payload

(2) Baffle for large angle scattering in cryostat



Design from Mike Smith – Caltech

(support from LIGO and U.S. National Science Foundation)

Needs **suspension inside **radiation shield** !**

Cryogenic payload

(3) Human resources : Graduate students

Ph.D. Students

Chen Dan : Heat links and vibration of shields

Sapphire fibers

Yusuke Sakakibara : Radiation through ducts

Takanori Sekiguchi :

Vertical spring at low temperature

Master Students

Takafumi Ushiba : Measurement

of thermal conductivity of sapphire fibers

Kazunori Shibata : Measurement of Q-values

of sapphire fibers

Cryogenic payload

(3) Human resources : Abroad

New members from abroad :

Warren Johnson, Riccardo DeSalvo

Cryogenic payload meeting : Language is English.

ELITES (WP1)

EVO meeting : Every month

(first meeting: 13th of April)

General meeting : 2nd-3rd (?) of August in Japan

Ettore Majorana and Luca Naticchioni

They will stay at Kashiwa (23rd-29th April).

We will discuss what Luca will do

on autumn of this year in Japan. 5