

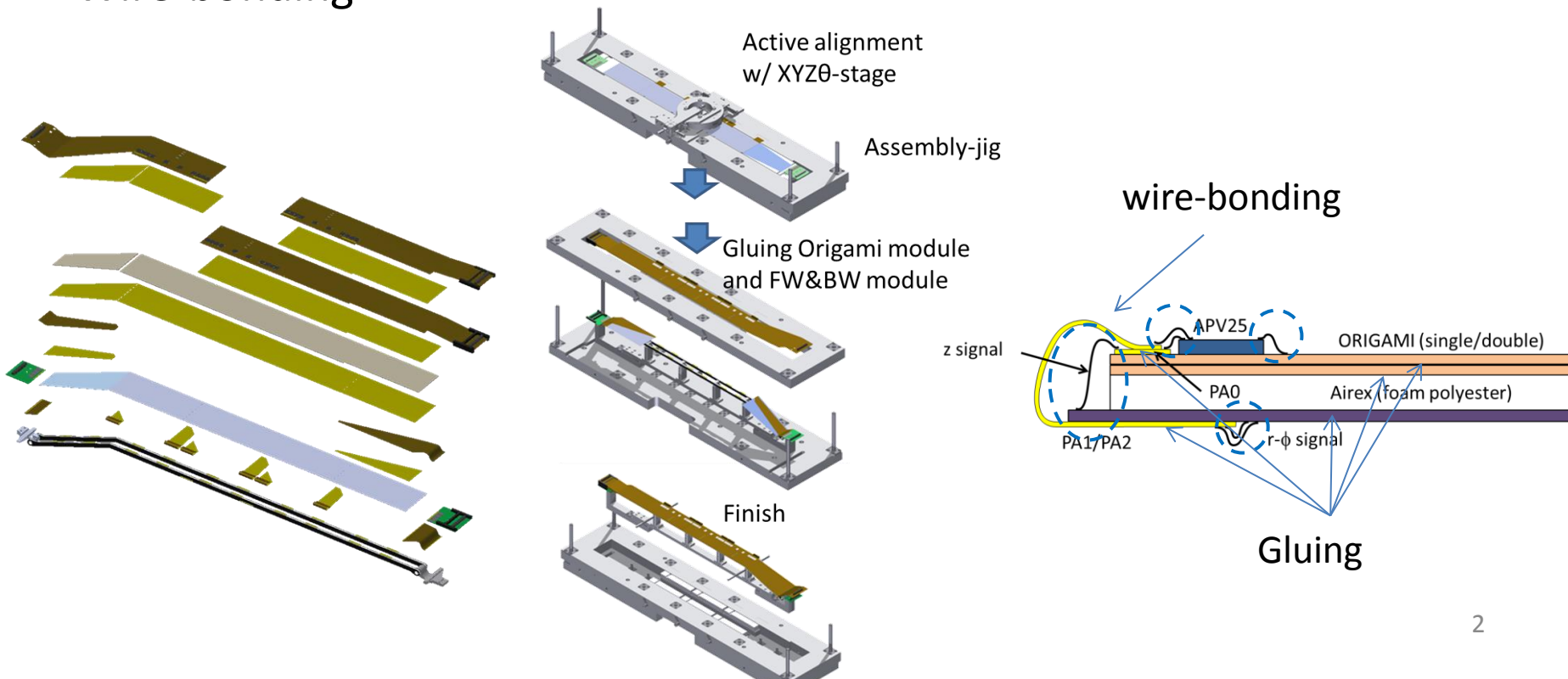
SVD assembly

Koji Hara (KEK)

Ladder assembly

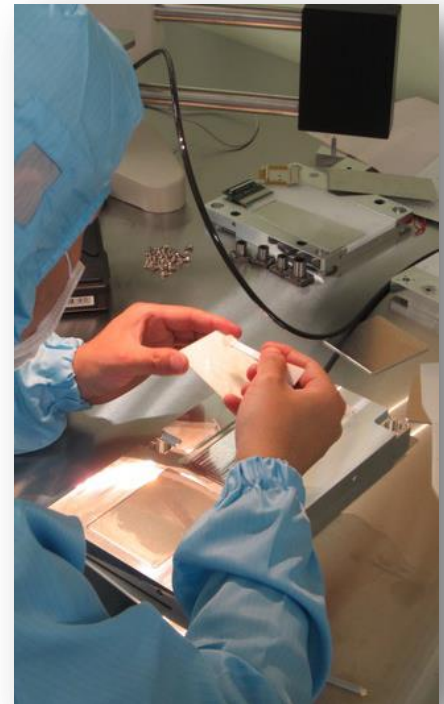
Key points

- Confirmation of ladder parts
- Jigs
- Procedure
- Gluing
- Wire-bonding



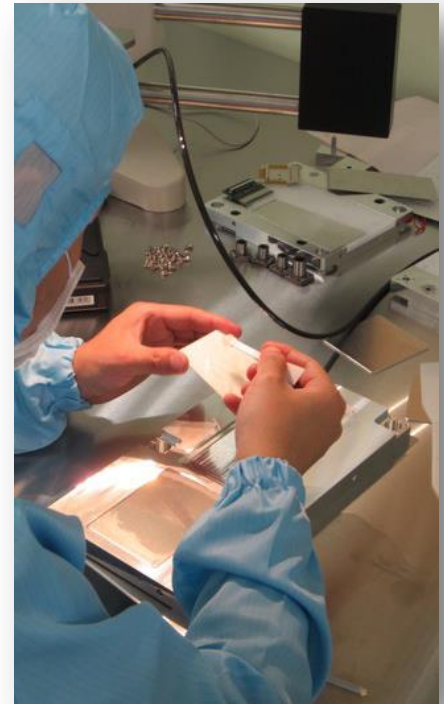
Ladder Assembly Preparation Status

- **Layer 6 (IPMU)**
 - Glue robot moved to IPMU
 - New student started gluing studies
 - Start of DY#3 assembly postponed to mid-Nov.
 - New IPMU staff started wire bonding studies
 - Some jigs require modification and / or verification
 - *Ladder production shall start in January 2014*
- **Layer 5 (HEPHY Vienna)**
 - Port and production of jigs → postponed
 - **Florian busy with mechanics re-design**
 - Jigs available by January
 - Setup and test of assembly jigs, gluing tests in January
 - Production of 2 prototypes February / March 2014
 - *Start of ladder production around April 2014*



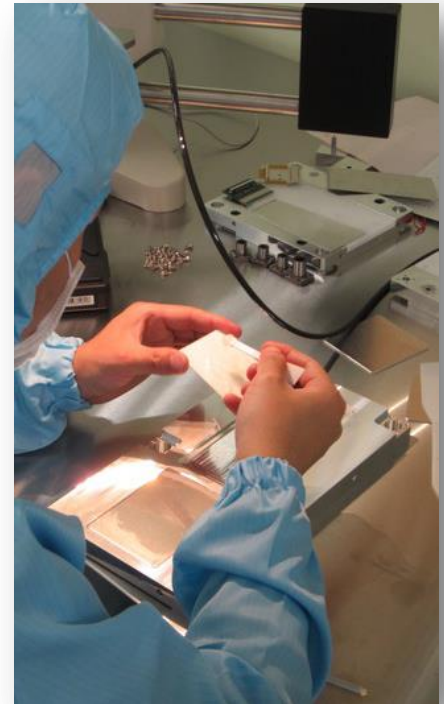
Ladder Assembly Preparation Status

- **Layer 4 (TIFR)**
 - 2 Persons are now at IPMU for wire bonding tests
 - Some jigs will be ready by end of October
 - **Plan to share others with IPMU (L6)**
 - There plan is to build mockup and prototype in November and December
 - Manpower situation and stay plans unclear
 - *Start of ladder production by January 2014 (?)*
- **Layer 3 (Melbourne)**
 - Design assembly procedure and jigs in progress
 - Verification of assembly procedure in Nov. (B2GM)
 - Jigs production and verification until March. 2014
 - Prototype production in April - May 2014
 - *Start of ladder production by June 2014*



Ladder Assembly Preparation Status

- **FW and BW modules (PISA)**
 - Option P
 - Alignment jig ready by end of October
 - Verification of sub-assembly alignment will be performed at Pisa in late October
 - Results will be shown in Nov. B2GM
 - Assembly jigs under development
 - *Start of module production by February 2014*



Preparation Status Summary

- Mechanics re-design was required
- All assembly sites still have open issues
 - Jigs preparation
 - Gluing procedure, wire bonding, etc.
 - **Electrically working prototype ladder**
- **Production start in January 2014 is not realistic**
 - Too many tasks to be covered with available manpower in that short time.
 - We should await results from thermal study
- SVD leaders prepare a detailed work plan
 - with a responsible person for each task
 - realistic manpower (resources) and deadlines
 - to be presented at the Nov. B2GM

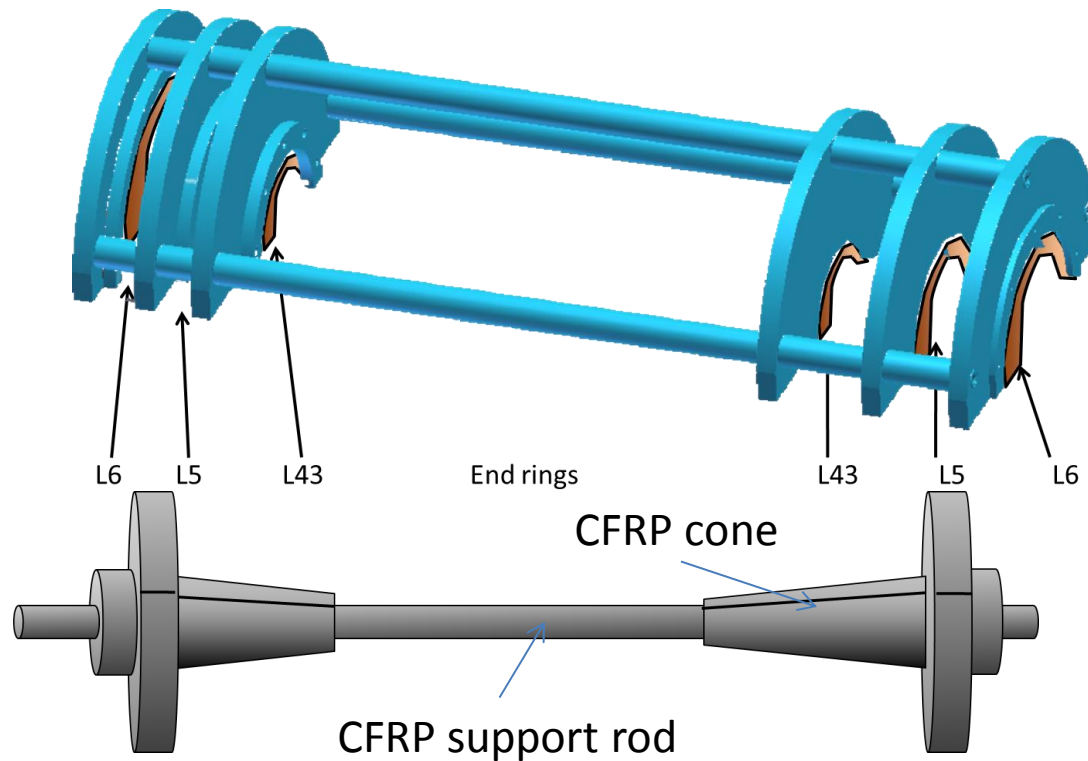
Issues

- Parts availability
 - New PA with curling removed, Origami with new PA glue
 - Rib and mount block design revised
- Prototype production
 - Mechanical precision, thermal deformation, electrical test
- Define common quality requirements for layers
- Effective way to share the results of quality control study

SVD assembly

- SVD structure assembly
- Ladder mount
- Constraint of KEK budget: parts must be bought in 2013 JFY
 - Buy parts in 2013 with enough redundancy for the final design
 - finalize in 2014

SVD structure assembly



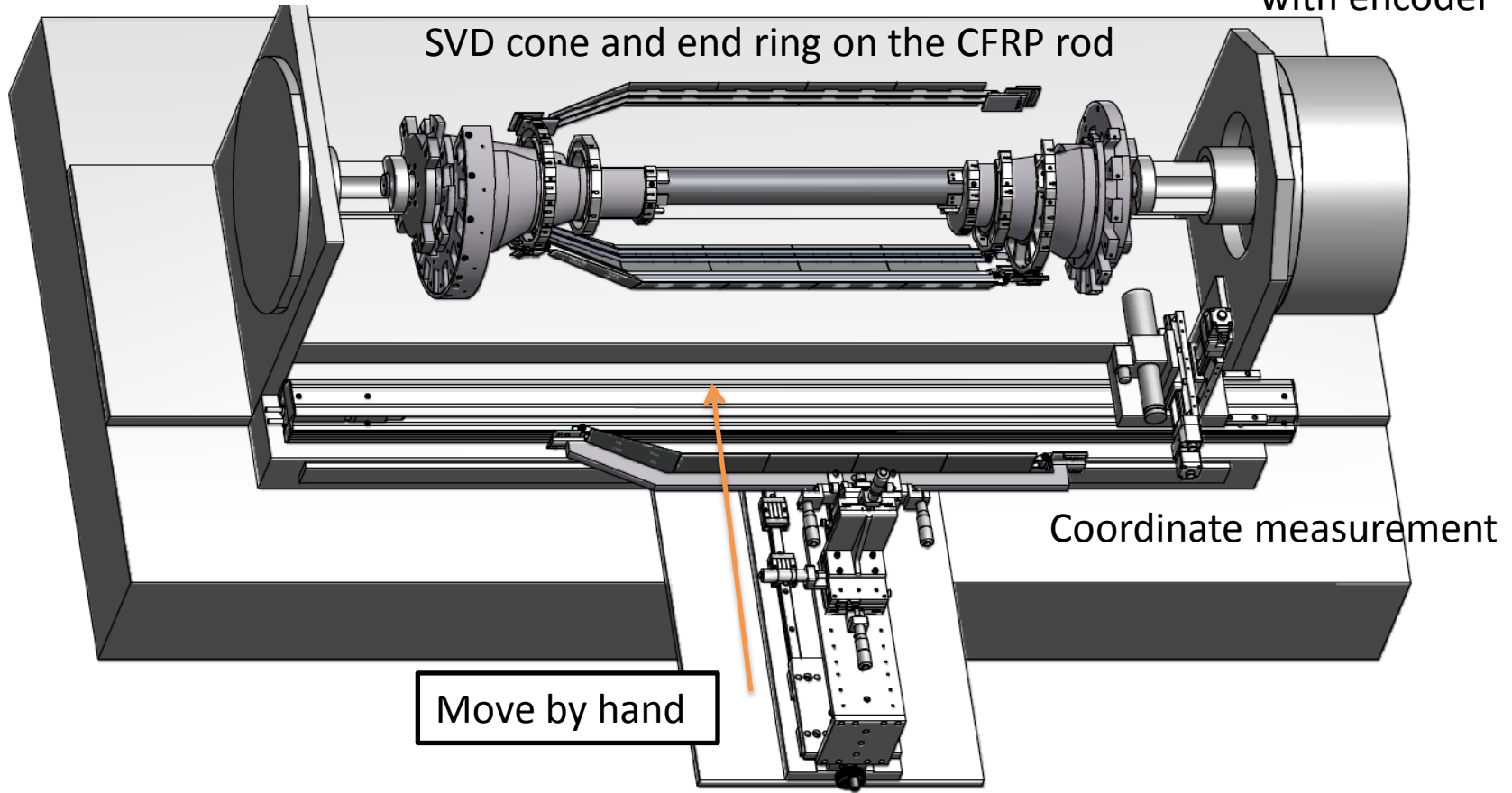
- Conceptual picture of Koike-san's idea
 - need jig production and test
 - Jig production in 2013 → test in 2014 spring
- Another idea will be tested for DESY thermal mockup

An idea of a ladder mount stage

Steel honeycomb table

Rotation axis
with encoder

SVD cone and end ring on the CFRP rod



Coordinate measurement

Move by hand

Ladder mount arm

- Mount ladders
- Mount CO2 pipes on Origamis
- Cooling, electrical test for a half layer

Ladder mount

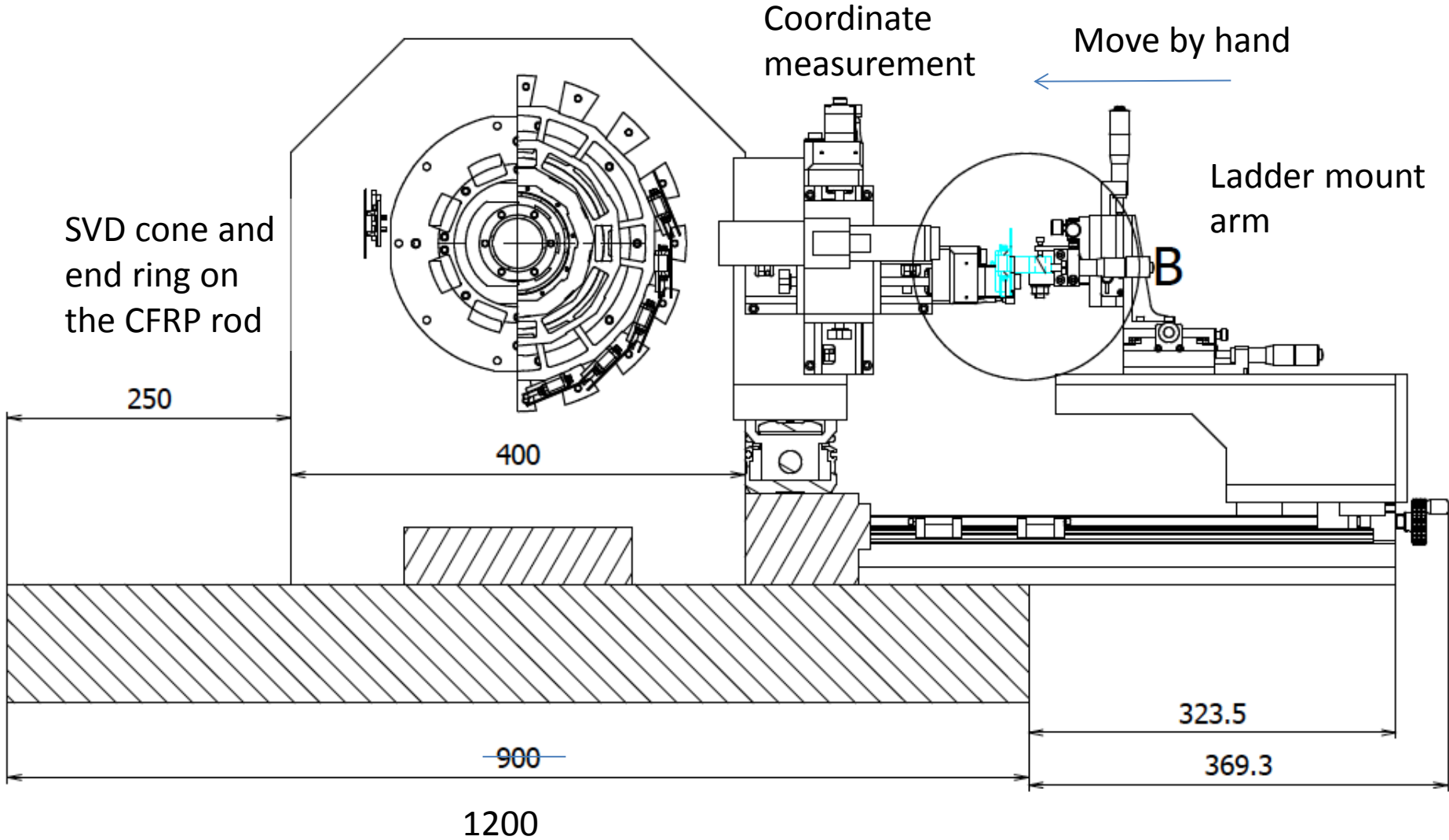
- Buy parts in 2013 JFY
 - Constraint of KEK budget
 - Table, linear guide, rotary encoder, parts for mount arm, microscope for position measurement, dividing jigs
- Not fix details in 2013
 - Keep redundancy: mount method (side, top)
- Final assembly of the mount stage in 2014
 - Mount test in 2014 autumn
- Demonstration of Belle SVD2 mounting method in Nov. B2GM

- Target precision (assembly, measurement)
50-100um
 - Practically possible and acceptable for the alignment
 - Possible to monitor valid mount position and deformation during the mount works

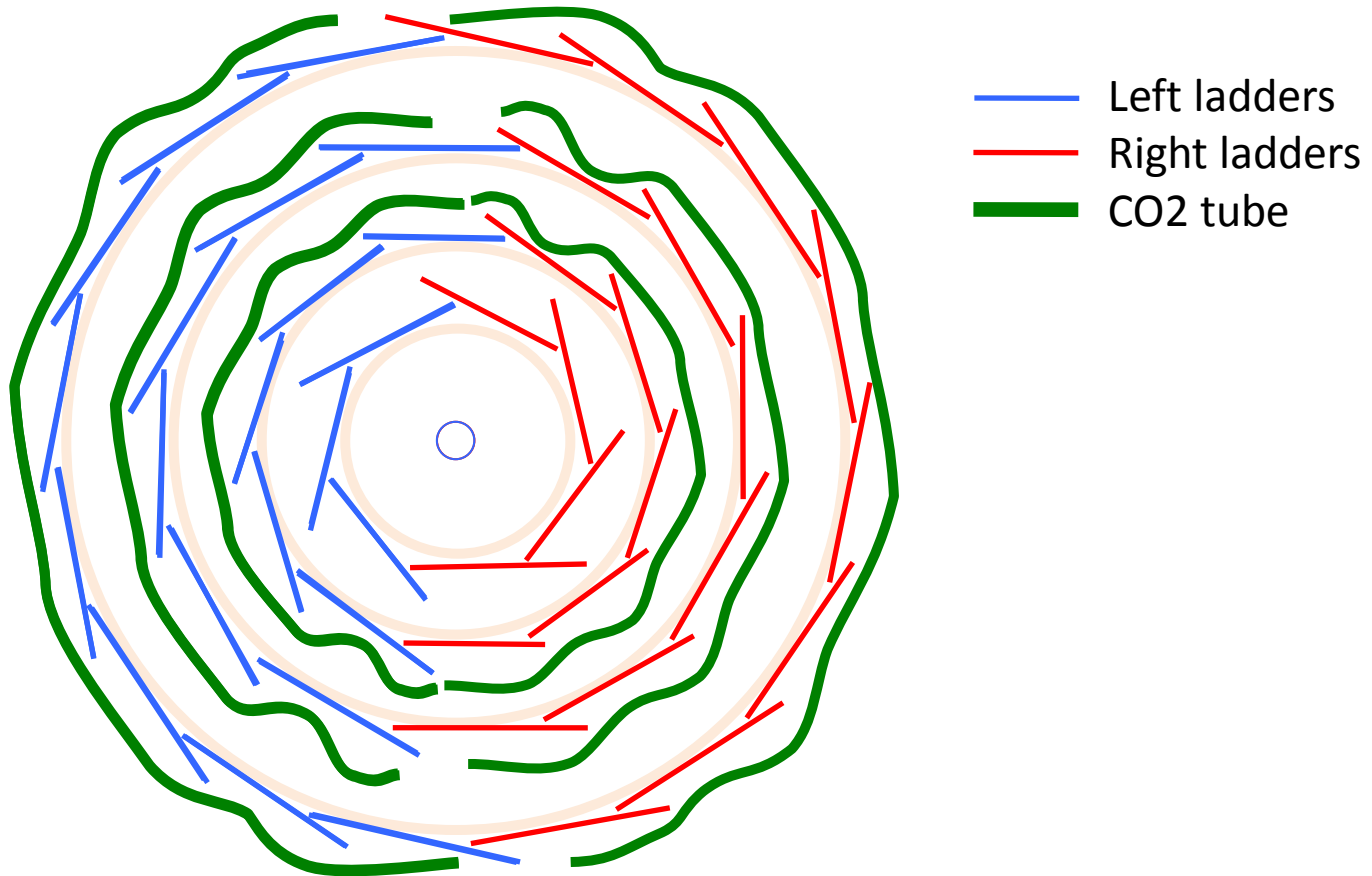
Remaining issue

- CO2 system for test during the ladder mount
- Method/jigs of CO2 pipe mount on Origami
- Ladder grabbing arm

An idea of a ladder mount stage



Animation



- In real ladder mount, the support is rotated and mount position is same.

