

Monolithic suspension

2014/3/18 Dan Chen

Topics

- Indium bonding
- Sapphire fiber
- HCB
- Diffusion bonding
- Blade for pendulum test
- Pendulum test 1
- Pendulum test 2

Indium bonding

Degree of achievement

- Thickness control test (50%)
- Q measurement (30%)
- Heat conductivity (30%)

Sapphire fiber

- Q measurement (at ICRR or Roma) (20%)
- Heat conductivity (30%)

HCB

- Delivery of sapphire blocks (100%)
- Bond blocks together (100%)
- Bonding time (100%)
- Heat conductivity (90%)

Diffusion bonding

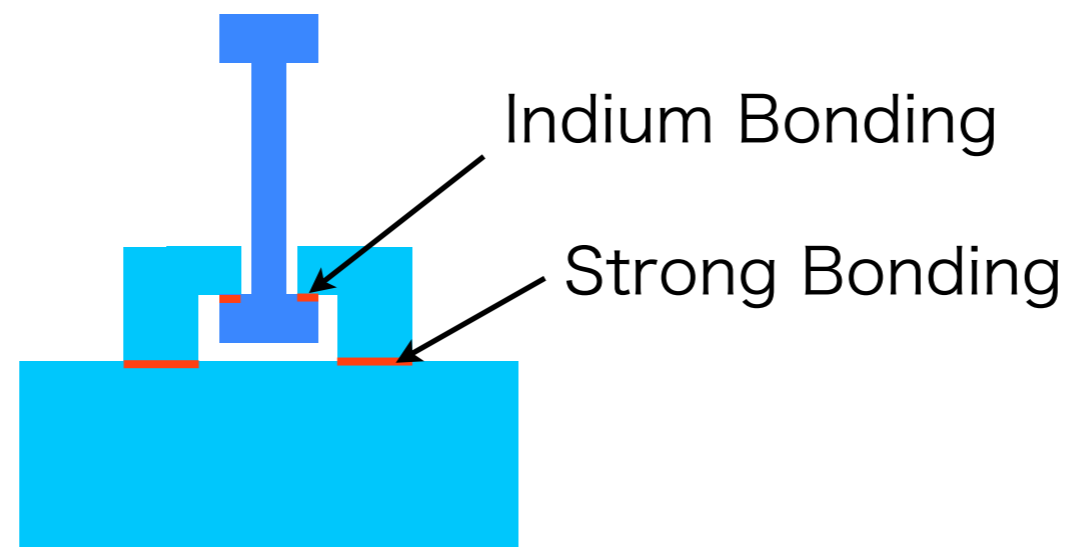
- Delivery of samples (70%)
- Delivery of bonded samples (0%)
- Cooling cycle test (0%)
- Q measurement (30%)
- Heat Conductivity (30%)

Blade for pendulum test

- Design (0%)
- Manufacture (0%)
- Q measurement (0%)
- Heat Conductivity (0%)

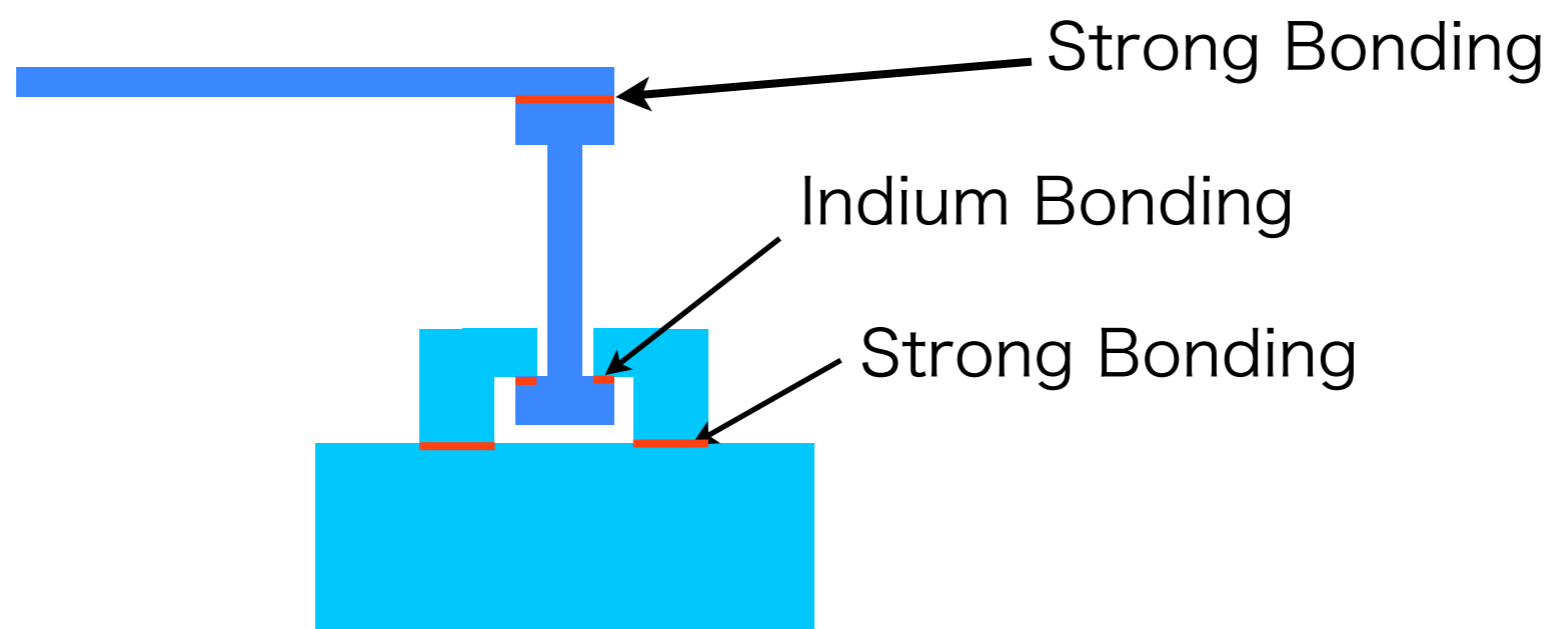
Pendulum test 1

- Simulation
- Bonding
- Measurement (Q and Heat conductivity)



Pendulum test 2

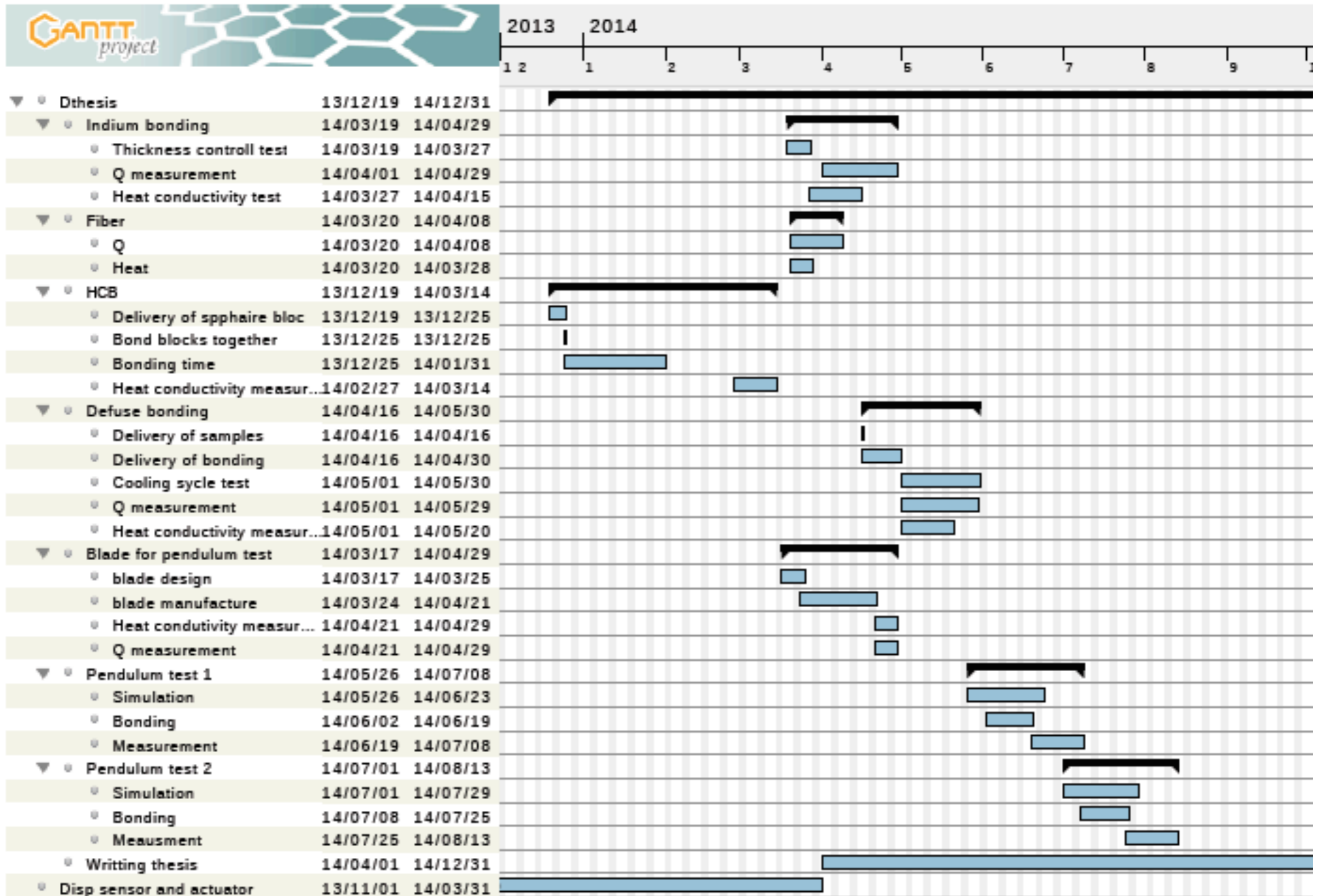
- Simulation
- Bonding
- Measurement (Q and Heat conductivity)



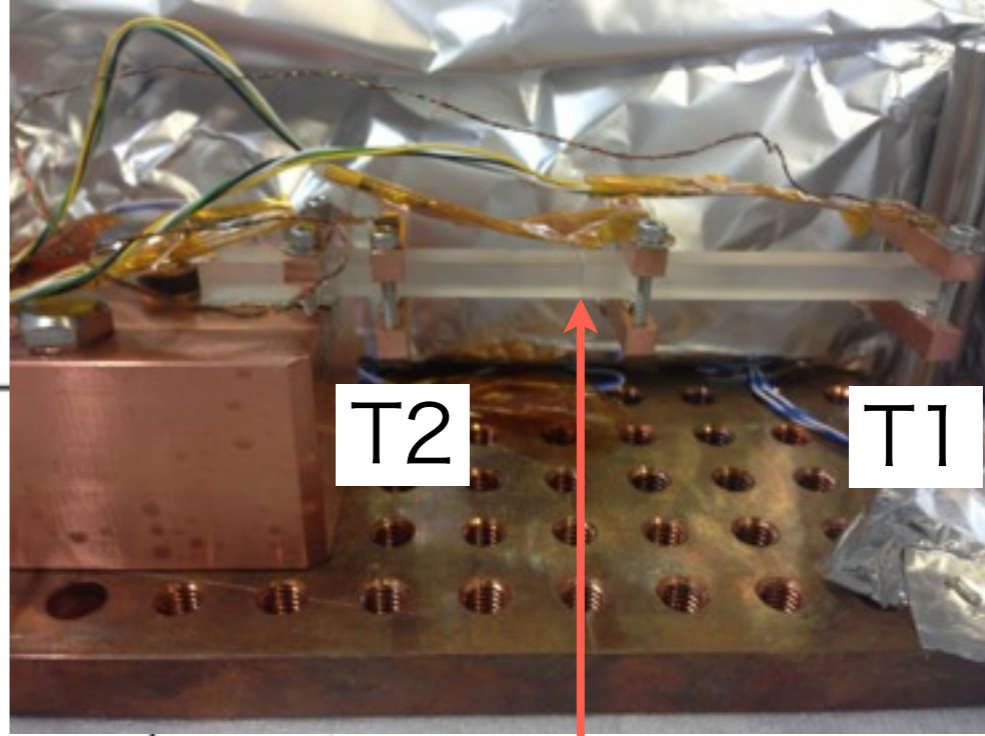
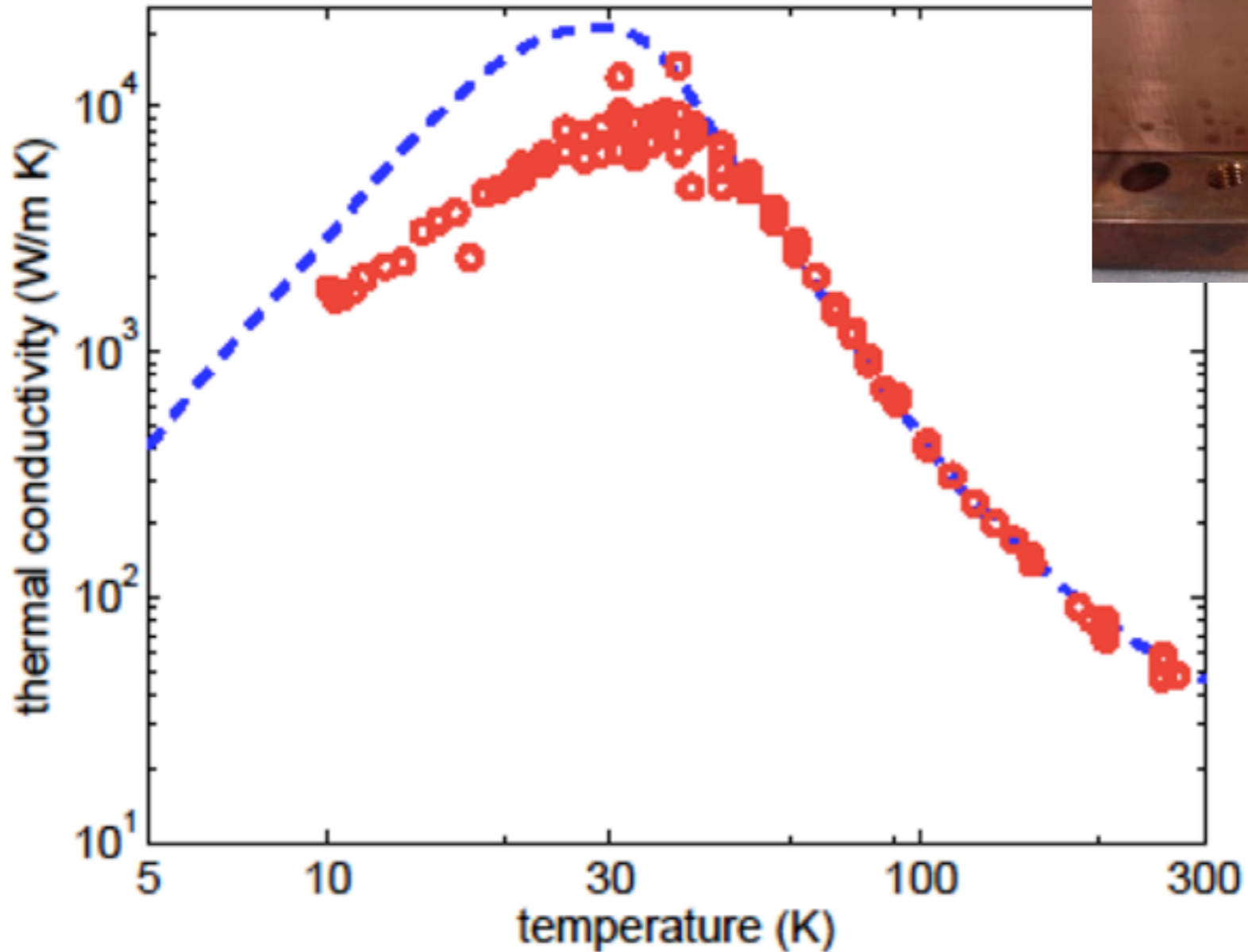
What will be results?

- We can suspend a TM using bonding.
- We can keep the TM of KAGRA cooling using bonding.
- We can reduce the thermal noise using bonding.

Schedule



Thermal conductivity of HCB sample



Heater

T2

T1

Bonding

comparison needed for sample with same geometry (size effect) + purity -> experiment currently ongoing