

Type B Installation Status

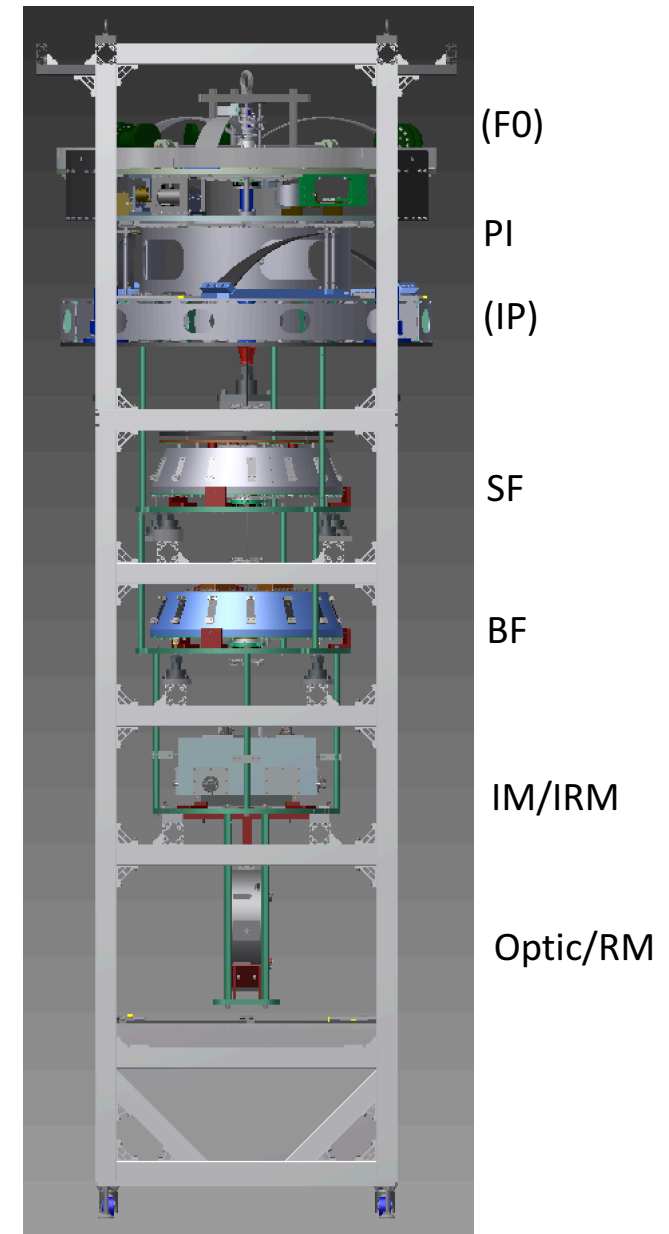
Yoichi Aso (slides by Mark Barton)

KAGRA Extended Chiefs Meeting, 5/15/2017

JGW-G1706717-v1

Scope

- One BS suspension
- Three SR suspensions (SR2, SR3, SRM)
- Each has
 - Preisolator (PI) with Inverted Pendulum table (IP) and GAS filter (F0)
 - Standard Filter (SF) and damper ring
 - Bottom Filter (BF)
 - Intermediate Mass (IM) and Intermediate Recoil Mass (IRM)
 - Optic (a.k.a., TM) and Recoil Mass (IM)
 - Lower breadboard, blade springs, and damper rings.
- SRx payload (TM/RM/IM/IRM) is similar to PRx – BS payload is unique

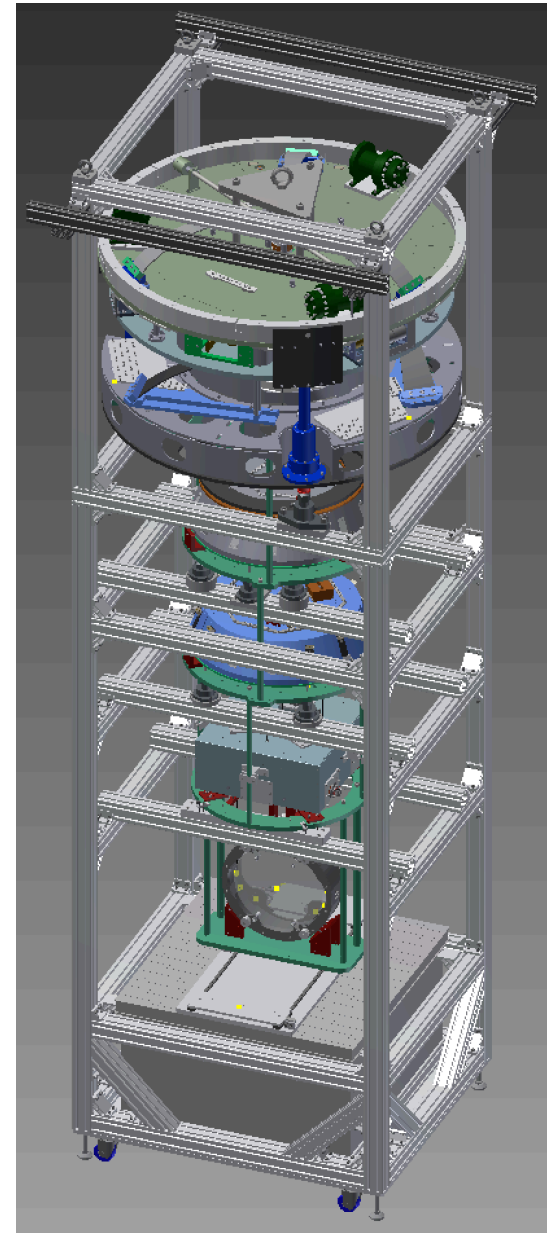


Team

- Core team
 - Mark Barton – leader, NAOJ, physicist
 - Fabian Peña-Arellano – NAOJ, physicist
 - Naoatsu Hirata – NAOJ, engineer
 - Enzo Tapia San Martin – NAOJ, electrical engineer
- Additional help from
 - Yuhang Zhao – Beijing Normal U via ICRR
 - Kazuya Yokogawa – Toyama U
 - Yuya Kuwahara – U Tokyo
 - Yingtang Liu – ICRR
 - Perry Forsyth – ANU
 - Koki Okutomi, Keiko Kokeyama, real time model
 - Ryutaro Takahashi – NAOJ, large purchases
 - Naohisa Sato – NAOJ, PI testing

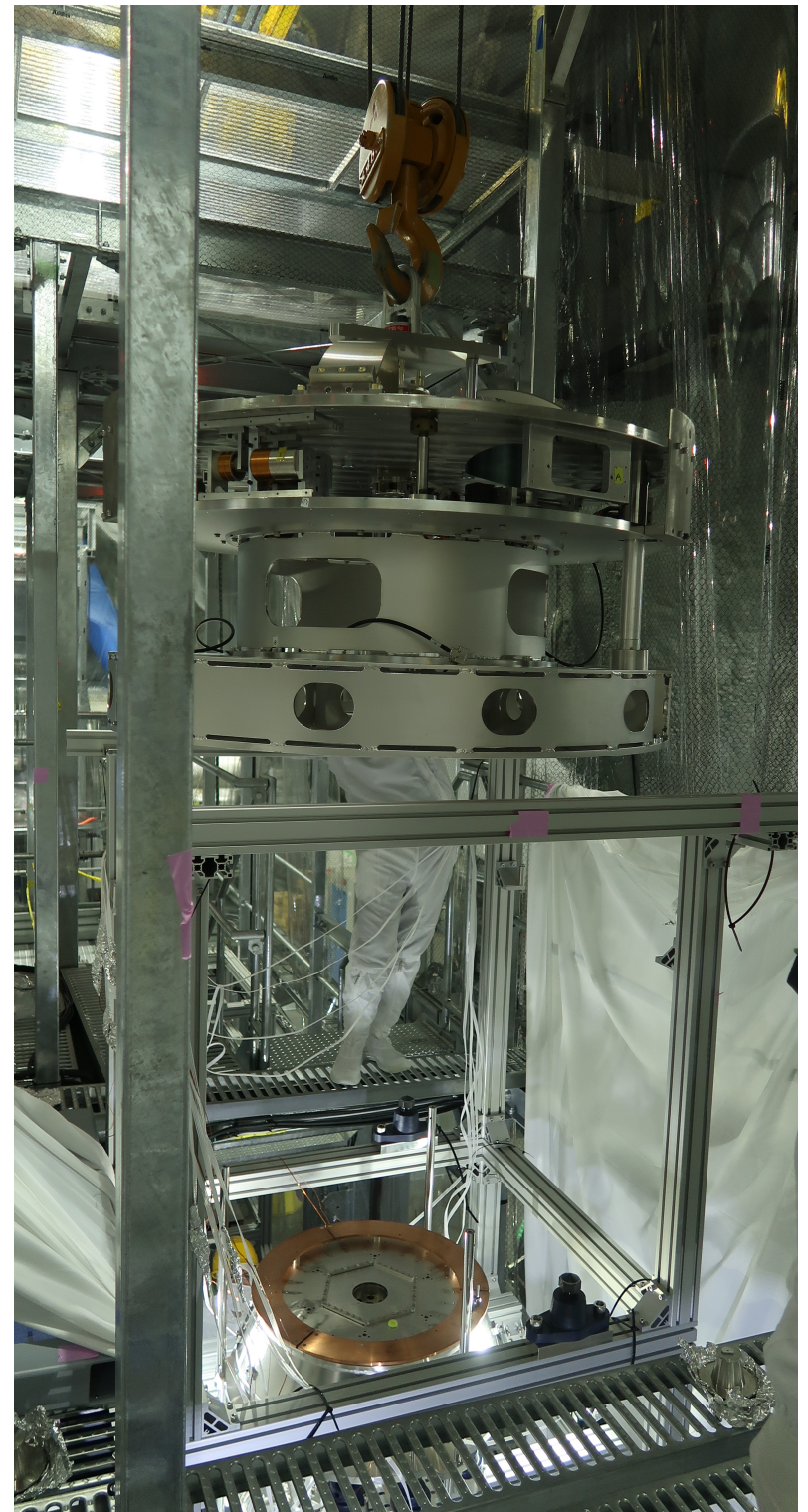
Installation Procedure

- Assembly frame based on versions for TAMA Type B test and PR3 test.
- Even more use of jacks to raise and lower sections independently (for hooking of maraging rods) without galling of screws in security structure.
- IM is now supported from main frame while BS and RM are hung from it – no separate hanging frame.
- Frame has extensions to hold cloth cover clear of PI.
- Frame has been constructed on the +Y side of the BS tank.
- SRx version will be near-identical.
- Documents:
 - E1605505 - BS mirror gluing
 - E1604817 - BS payload
 - E1504235 – BS main procedure



Current Status - BS

- All parts are in hand except final BF/SF ballast masses (being designed).
- Test hang with dummy BS is ongoing.
- Considerable delays due to technical issues.
- PI has been installed in assembly frame, with SF/BF/IRM/IM/RM/BS hanging from it.
- Rack and in-air cabling done.
- New stub flags and coil-only OSEMs delivered.

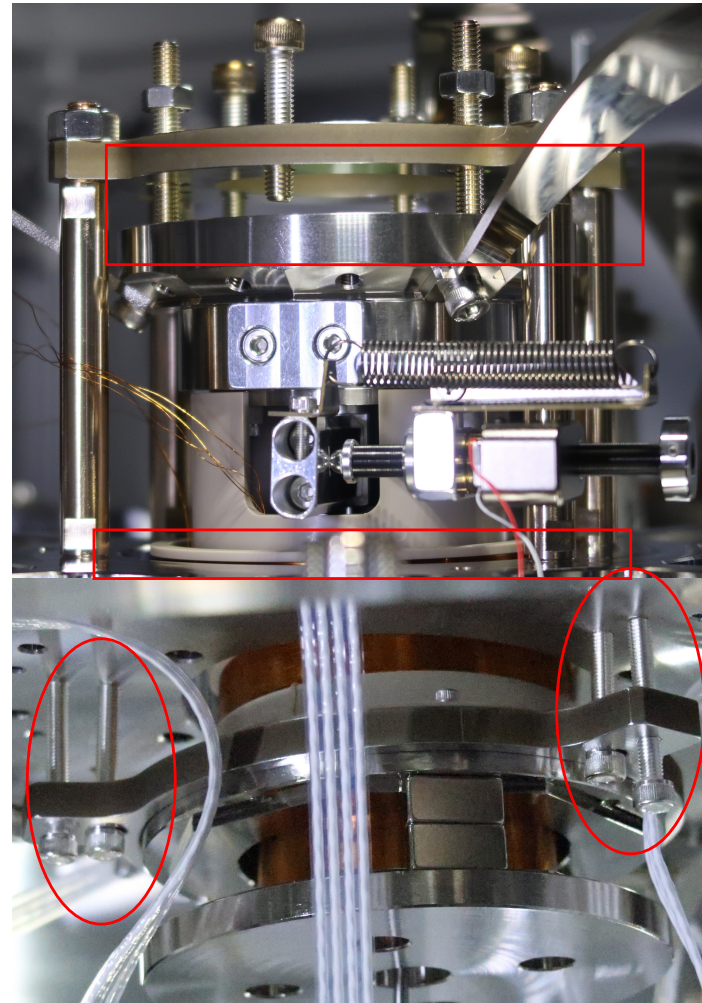


Current Status - SRx

- Have parts for SR2 and SR3 payloads (i.e., the ones originally intended for iKAGRA).
- Ready to order in new financial year:
 - Payload parts for SRM (being ordered jointly with PRM – Type Bp)
 - Fasteners for three SRx.
 - Modifications of some parts based on lessons learned from BS/PR3.
 - Two new RM.
- Being prepared for ordering:
 - Second assembly frame.
 - Additional in-vacuum cables, OSEMs, and pico and stepper drivers.
- SF and BFs are pre-assembled.
- PI stages are on order from Nikhef but need setup/testing – Sato-san of Type A group is helping.

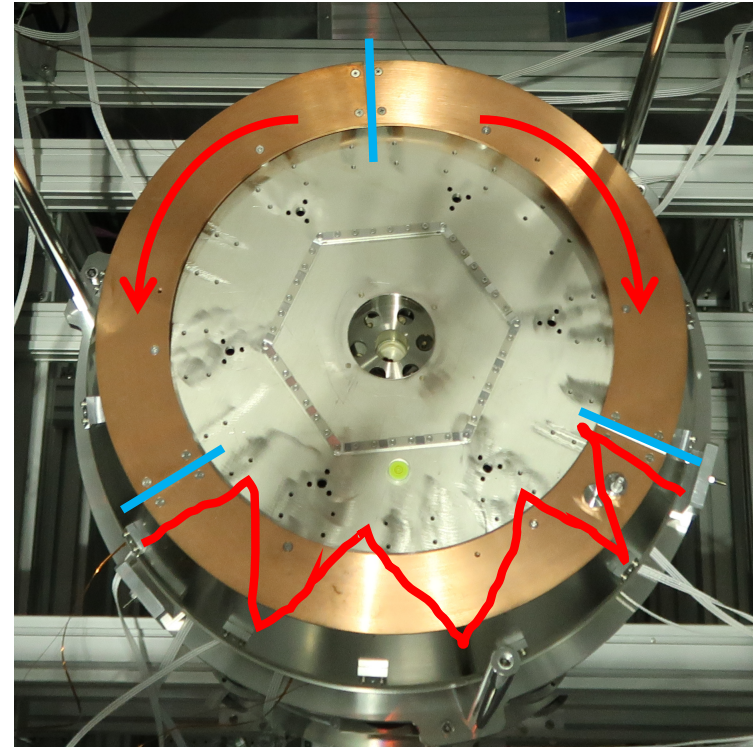
Technical Issues 1 – BF

- BF had multiple problems (drop in load capacity, increase in frequency, tilted keystone).
- These were thought to have been fixed or worked around.
- Unfortunately, it seems to have lost another increment of load capacity and no longer fully supports the IM/RM/BS.
- For the BS Test Hang, we have locked the keystone.
- Before the real BS installation we will do a complete rebuild.



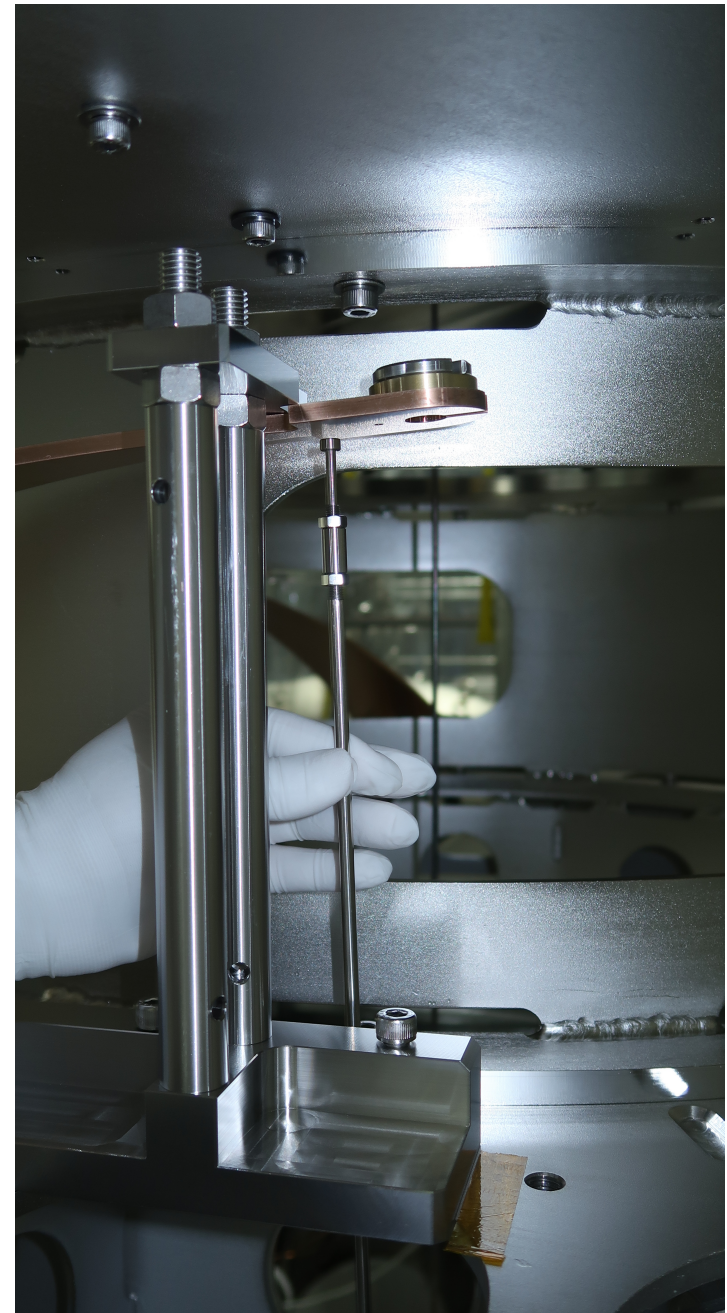
Technical Issues 2 – SF ballast

- The SF GAS spring was quite strong, requiring a lot of ballast in the BF.
- The PI GAS spring was quite weak (at least as measured by G&M), and with the heavy BF seemed to require a *negative* amount of ballast in the SF.
- Fortunately the PI was a few kg stronger than reported and we can save another 3.3kg by removing one of the three segments of the Cu damper on the SF.

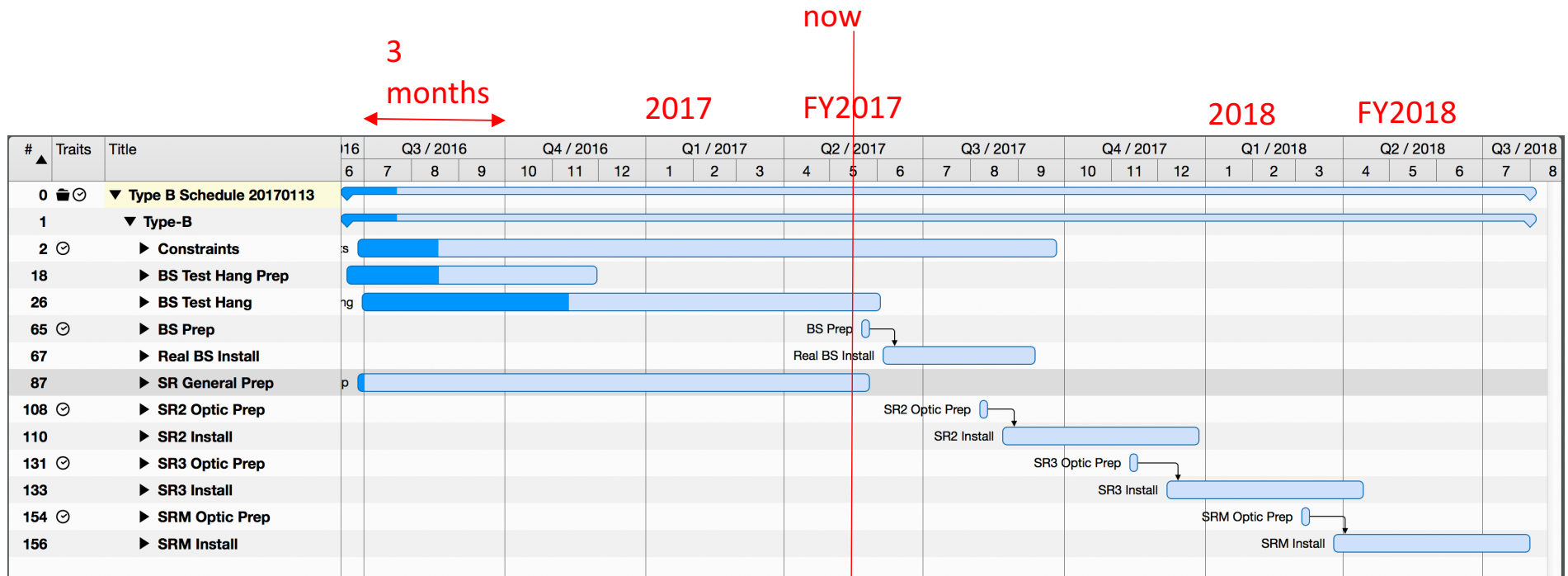


Technical Issues 3 – Lower Breadboard Blades

- The blades supporting the LBB had two different problems due to mistakes in Promec drawing :
 - Holes for clamp screws were $\varnothing 11$ mm instead of $\varnothing 12$ mm -> we already got them drilled out.
 - Blades were 21 mm too long, so maraging rod didn't align with hole in PI bottom section -> we will add a new hole further from the tip.



Schedule



About 5 weeks delayed relative to January schedule, but we hope to make up some time by skipping some time-consuming TF tests in the BS Test Hang.

Schedule/Manpower Issues

- Four people just barely enough.
 - Hirata-san has done a big chunk of SR procurement (quotes for third payload etc) but *lots* still to do.
 - Lots of SR preassembly still to do – Pls, RM, IM, IRM, optics.
 - Lots of SR documentation still to do.
 - Hirata-san has been able to come to the site recently, but will soon be occupied with SR procurement.
 - Schedule assumes significant help from Type A team in construction and testing of Pls.
 - Aso-san has arranged for students to help: Zhao, Yokogawa, Kuwahara, Liu, Forsyth, but manpower is still limiting.
 - Could use a digital systems expert – Kokeyama-san and Okutomi-kun have helped (thanks!), but lots to do.