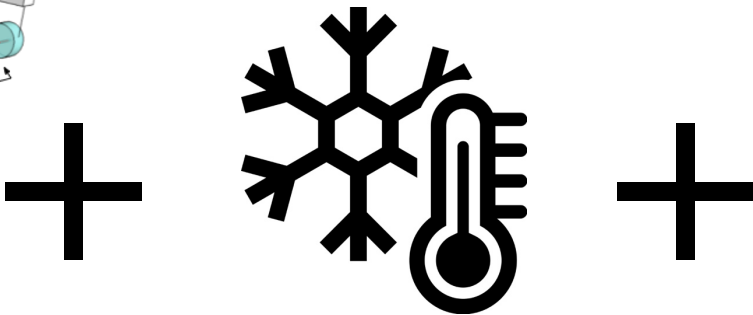
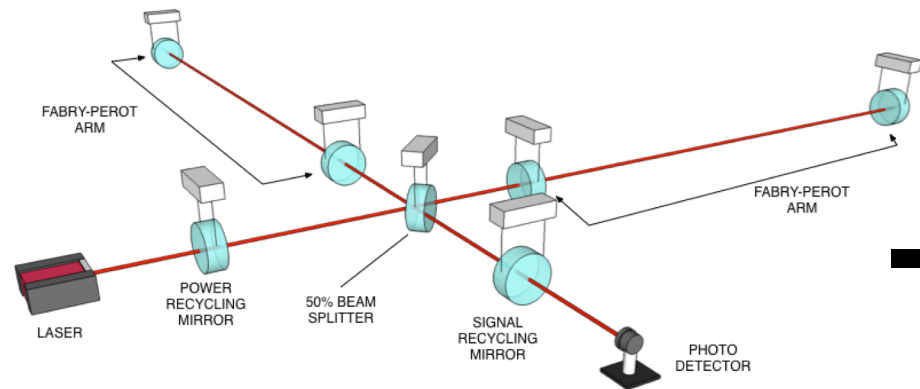


KAGRA: Status and Near Term Plans

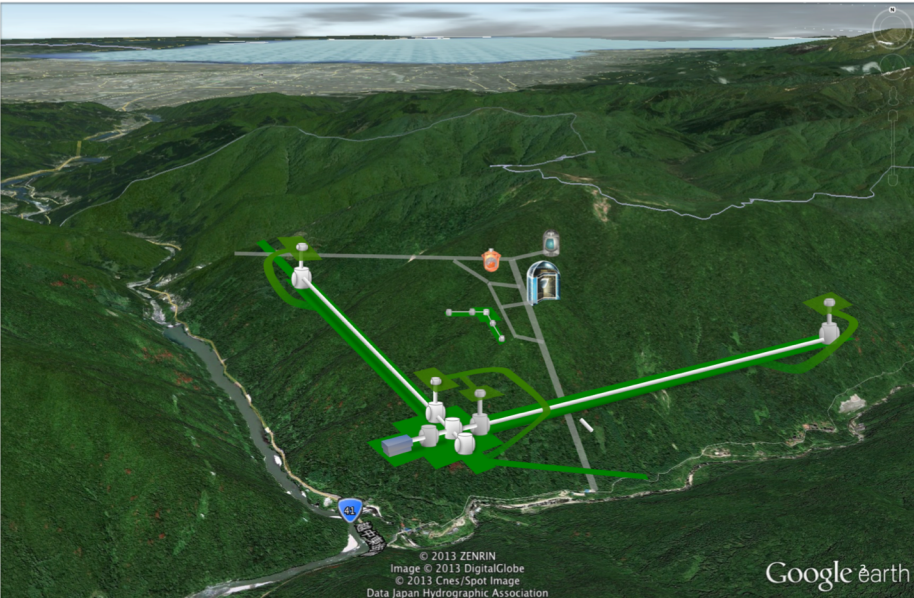
Y. Enomoto and K. Izumi for the KAGRA collaboration

GWADW2018 on May/12/2018 at Alyeyska resort

Very brief introduction of KAGRA



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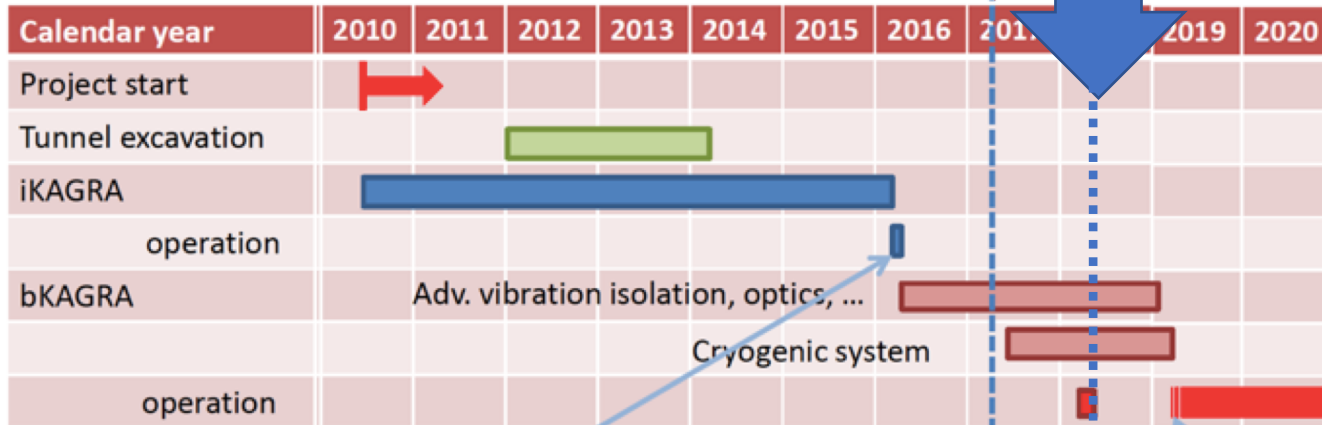
What we said in GWADW2017



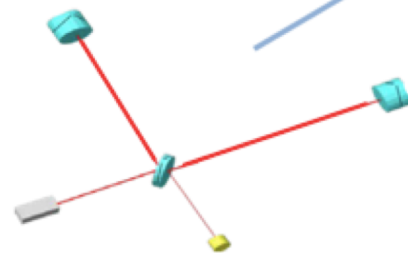
Overall plan

GWADW2017

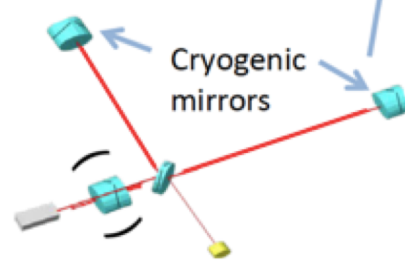
TODAY



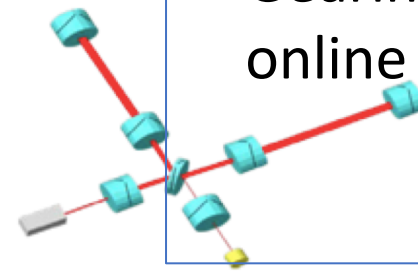
- ✓ In the middle of the bKAGRA phases
- ✓ Phase 1 concluded with one ETM cooled, instead of two
- ✓ Gearing up towards making KAGRA online during O3



iKAGRA



Phase 1
Michelson with two
cryogenic mirrors.



Phase 2
Four cryogenic
mirrors.

8

Phase 3
DRFPMI with four
cryogenic mirrors.
Observation run

Initial KAGRA
Michelson at room temp.

JGW-G1706501

GWADW 2017 at Hamilton island, Osamu Miyakawa

Slide by O. Miyakawa

Major news since GWADW2017

- ✓ KAGRA expressed the intention to **possibly join O3**.
- ✓ **ETMs are now sapphire mirrors** with 14-m suspension system.
- ✓ ETMY had been maintained at a **cryogenic temperature 18K**.
- ✓ The phase-1 run was conducted (Apr.28-May.6).

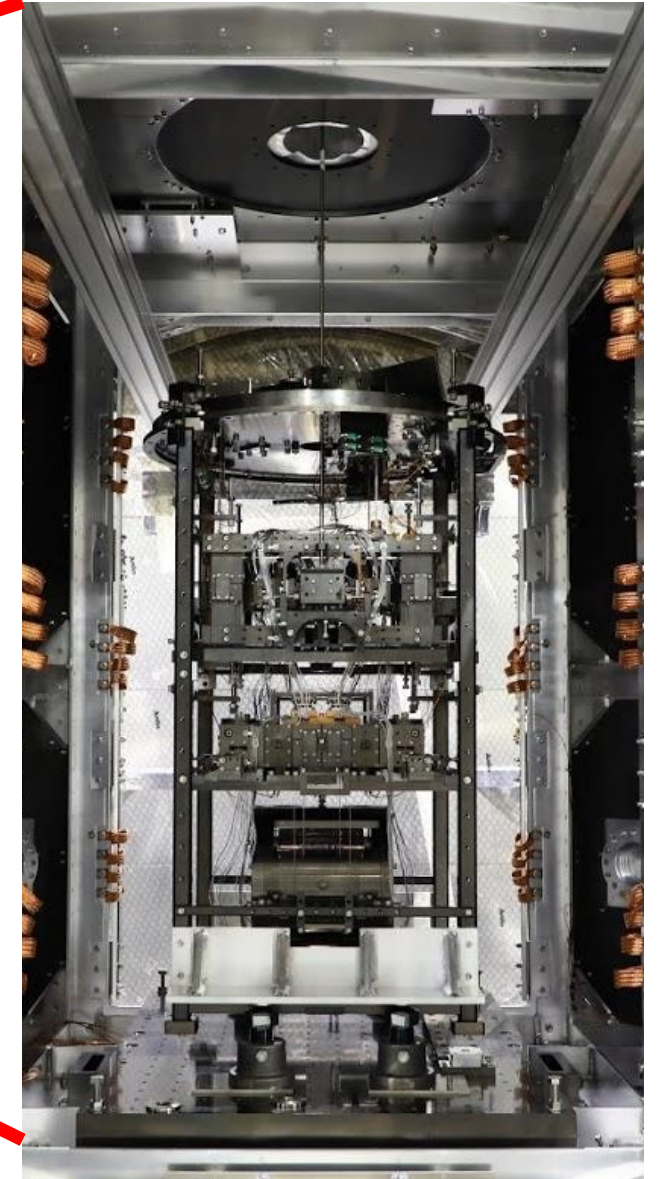


Intensive hardware installation is underway

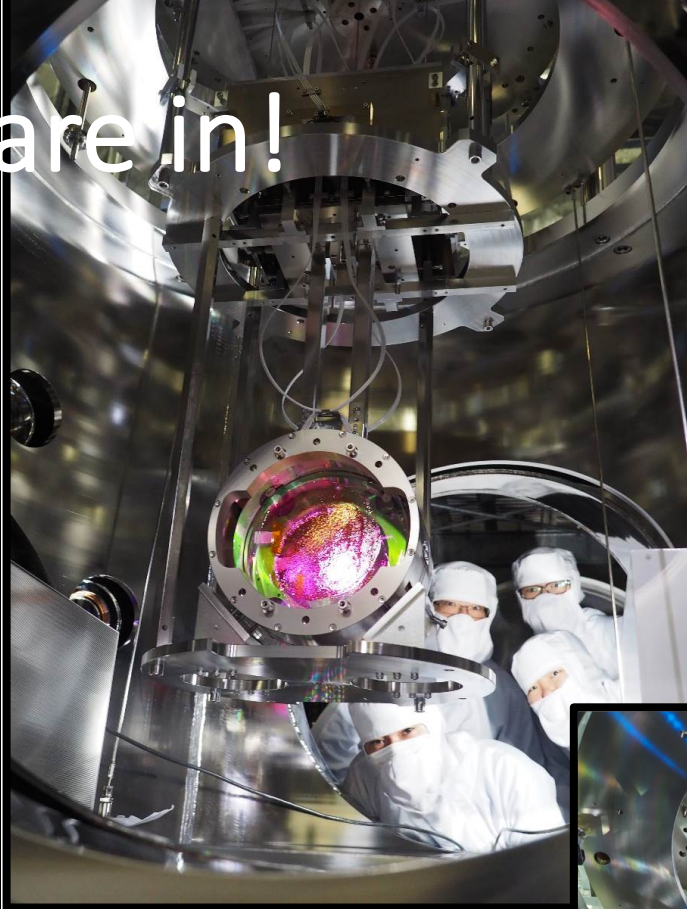
- ✓ All three PR suspensions are installed and actively damped.
- ✓ The BS suspension are installed and actively damped.
- ✓ The PCAL in-air optics at both ends are in place.
- ✓ The beam reducing telescope (BRT) at EY is installed.
- ✓ A cooling test of the wide angle baffle (WAB) concluded.
- ✓ and more..

Cryo-payloads with sapphire mirrors installed!

- To both X and Y end chambers.
- ETMY was subsequently cooled down while ETMX was intentionally left at room temperature for comparison.



Core suspensions are in!

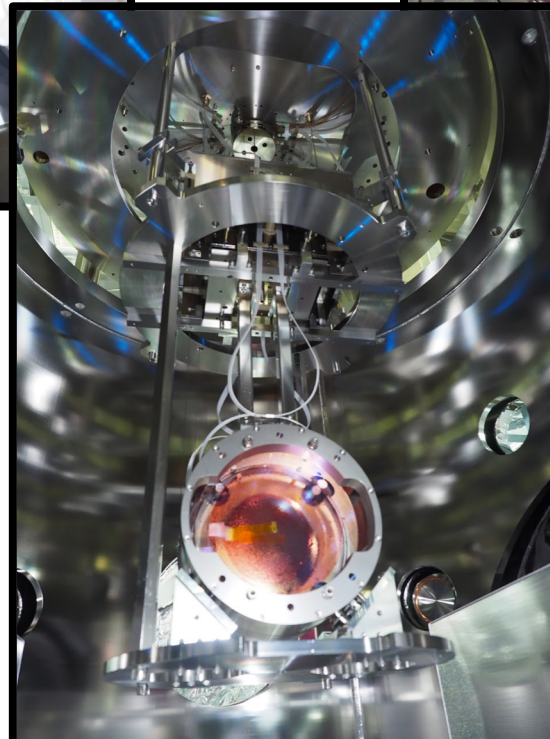


PR3



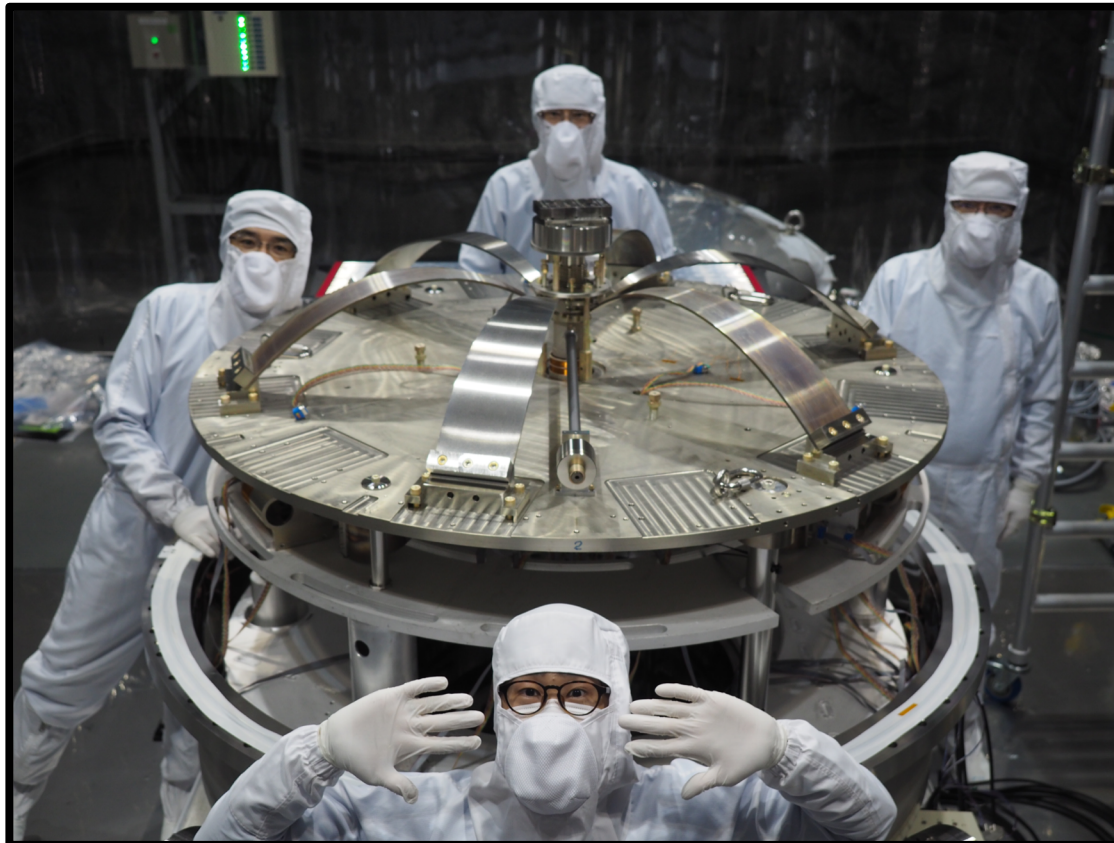
PR2

BS

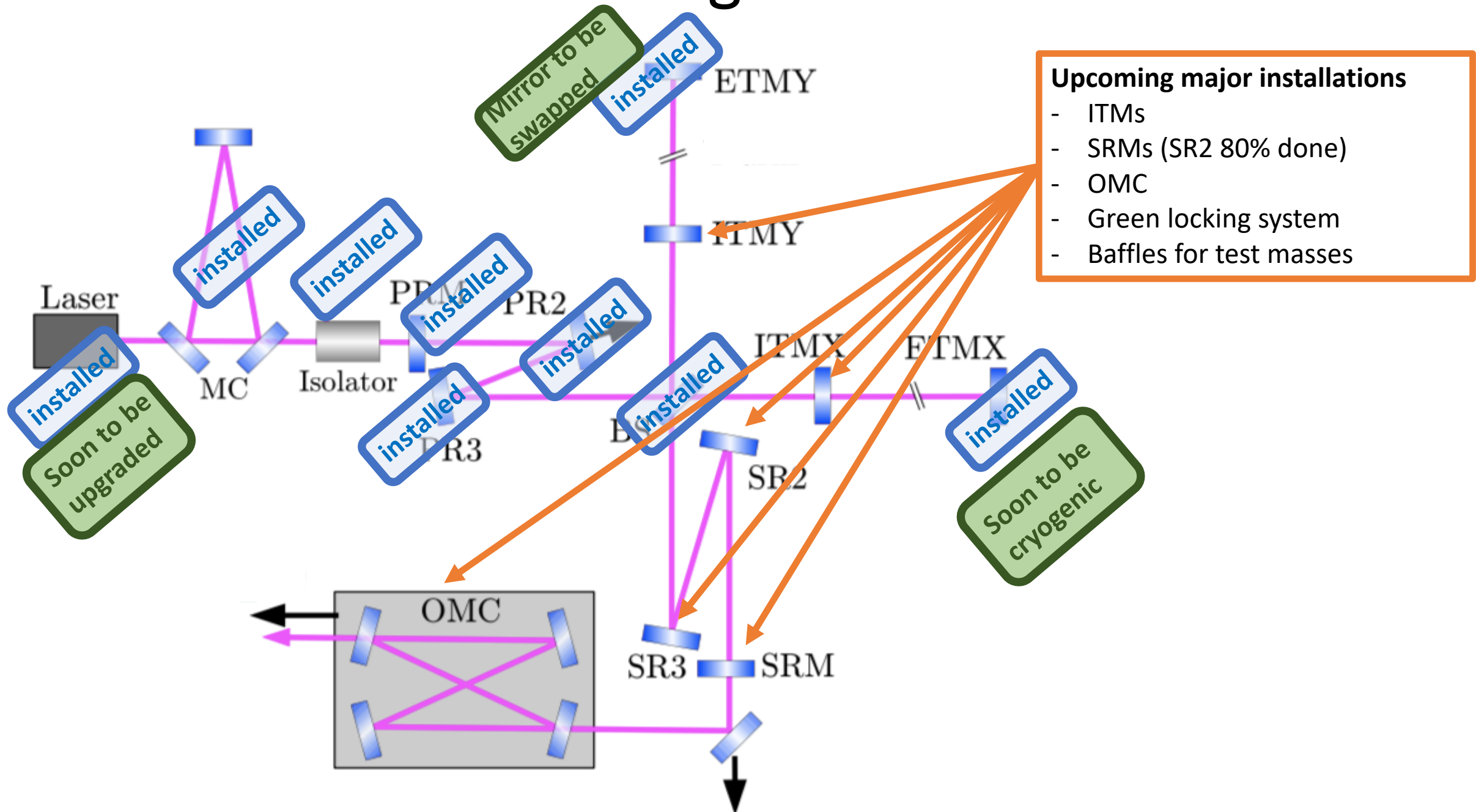


PRM

Type-A Suspensions successfully installed!



How KAGRA looks like right now



Issues that are spotted during Phase 1

None of them seem to be a showstopper.

✓ Large ETMY angular fluctuation

- ✓ => Electronics wires may be touching some part of the cryogenic shield
- ✓ => A modification was made for ETMX which so far doesn't show such behavior. The same modification will be applied to ETMY.

✓ Three (out of five) ETMY GAS filter stages mechanically touching.

- ✓ => Two of them will be released shortly after venting the chamber.

✓ Dust accumulation on the ETMX mirror's surface after a vent-cycle.

- ✓ => We are thinking of performing in-situ cleaning (e.g., first contact)

✓ Occasional DAC glitches coinciding with sudden increase of CPU load.

- ✓ => Suspension controllers have been suffering from this.
- ✓ => Reducing the sampling rate from 16 kHz to 2 kHz reduced the rate of glitches.

Deciding on interferometer configuration for O3

For joining O3, we have been consolidating the installation/commissioning schedules in great detail.



**We needed to determine what IFO configuration to aim for
e.g., Virgo's strategy of not doing SR for giving more commissioning days.**

Giving up signal-recycling?

=> This does not significantly increase the commissioning days.

=> A blank SRM optic already ordered for this purpose, anyway.

What if we do Fabry-Perot Michelson (i.e., no power- or signal-recycling)?

=> It appeared to be a good fallback plan in case we cannot make it to RSE

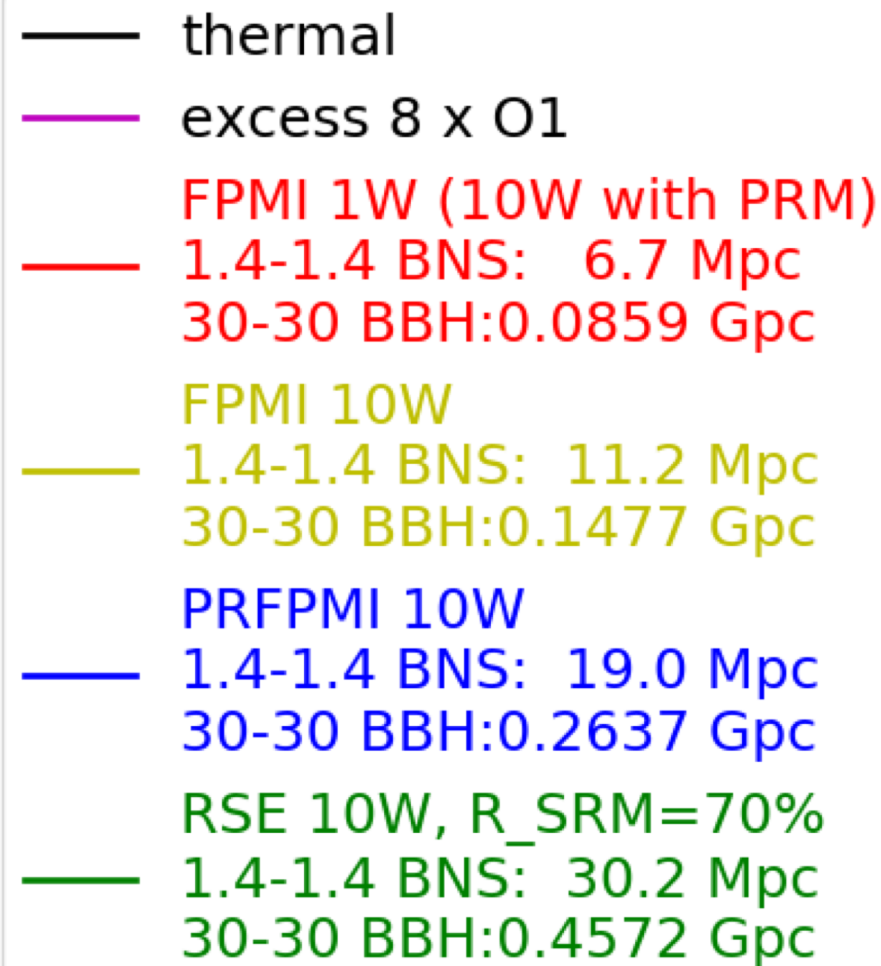
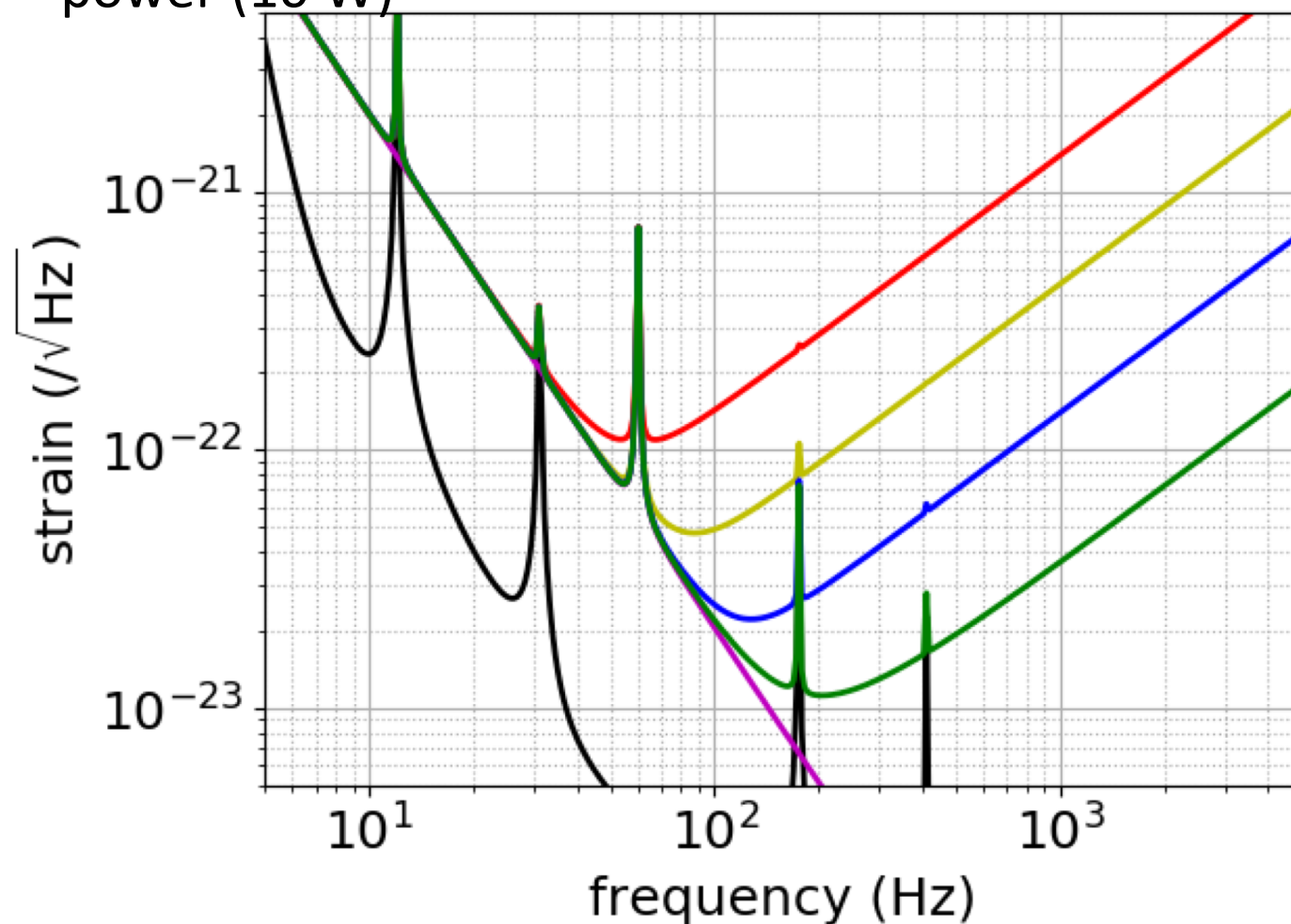
=> In this case, PRM will be deliberately misaligned and SRM will be either blank optic or misaligned.

Sensitivity estimations for various configs.

Assumptions:

Excess low freq. noise (8 times LIGO's O1 noise or 2 times Virgo's O2 noise) and low PSL power (10 W)

Enomoto+, JGW-T1808172-v3



The scenario

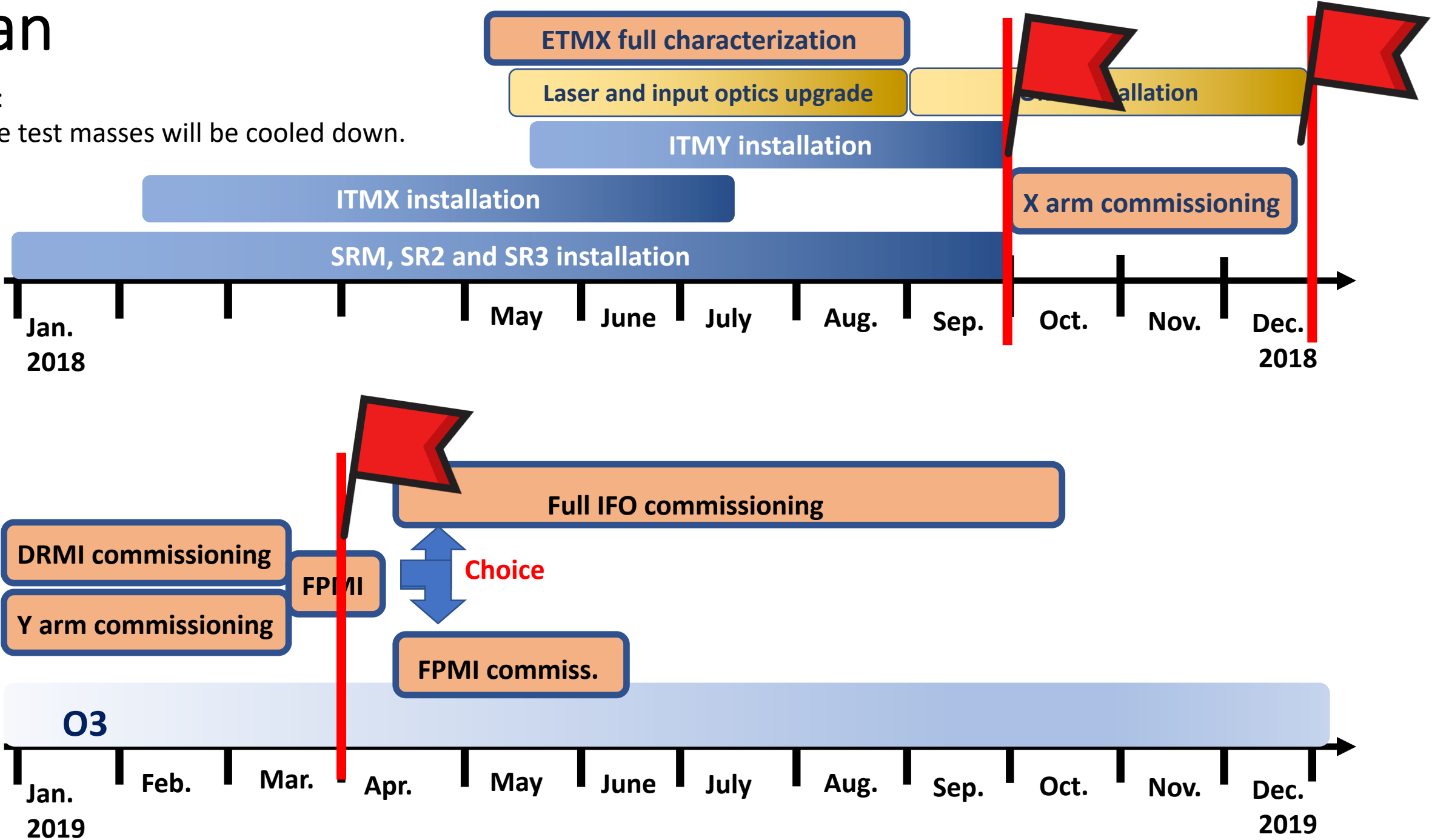
On May. 9th, the KAGRA executive office has just approved the suggestion that

“We should keep ‘RSE scenario’. At the same time, we should often check preparation status for RSE components and judge to select FPMI due to insufficient preparation; checking points are every end of Sep/2018, Dec/2018 and Mar/2019. The ‘PRFPMI’ was deleted from the option “

The consensus among all the collaborators for this strategy will be made in the coming KAGRA face-to-face meeting (May. 18-20)

Plan

Note:
all the test masses will be cooled down.



Do not miss the KAGRA-related talks!

- Y. Enomoto on *Phase 1 run* (in a minute)
- K. Somiya on *KAGRA+* (Mon.)
- Y. Michimura on *optimization of IFO parameters* (Mon.)
- S. Miyoki on *experience with underground facility* (Tue.)
- E. Capocasa on *filter cavity experiment at TAMA* (Wed.)
- T. Miyamoto on *local control of KAGRA ETM suspensions* (Thur.)
- K. Hasegawa on *mirror contamination* (Thur.)