



大型低温重力波望遠鏡計画 KAGRAの現状 Status of KAGRA

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高エネルギー加速器研究機構、他



Global Network of GW detectors

GEO 600m (9.8072E, 52.2451N)



advanced LIGO
(Livingston) 4km

(90.7749W, 30.5624N)



Virgo 3km
advanced Virgo (10.5040E, 43.6313N)



(Hanford) 4km

(119.4077W, 46.455N)



LIGO India

TAMA 300m
CLIO 100m

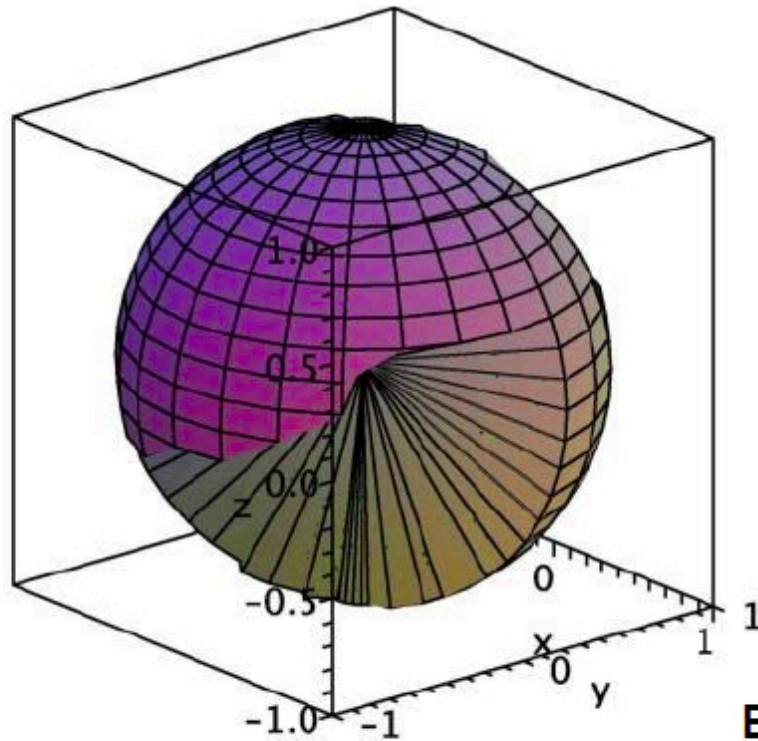
KAGRA 3km

(137.311E, 36.4273N)

KAGRA in network

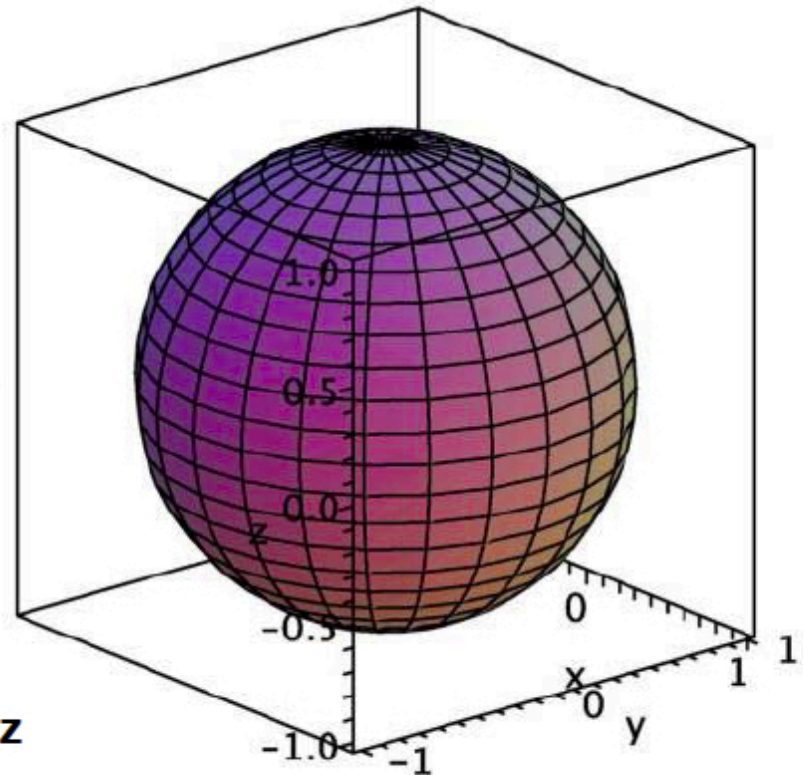
LIGO(H)+LIGO(L)+Virgo

- Coverage at 0.5 M.S.: 72%
- 3 detector duty factor: 51%



LIGO(H)+LIGO(L)+Virgo+KAGRA

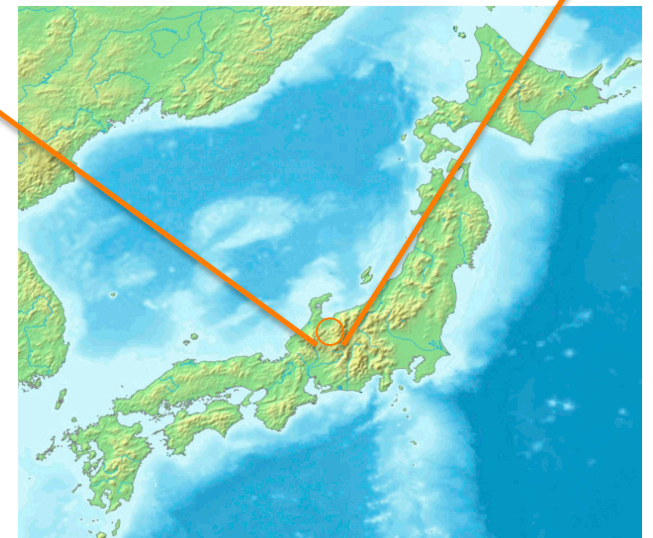
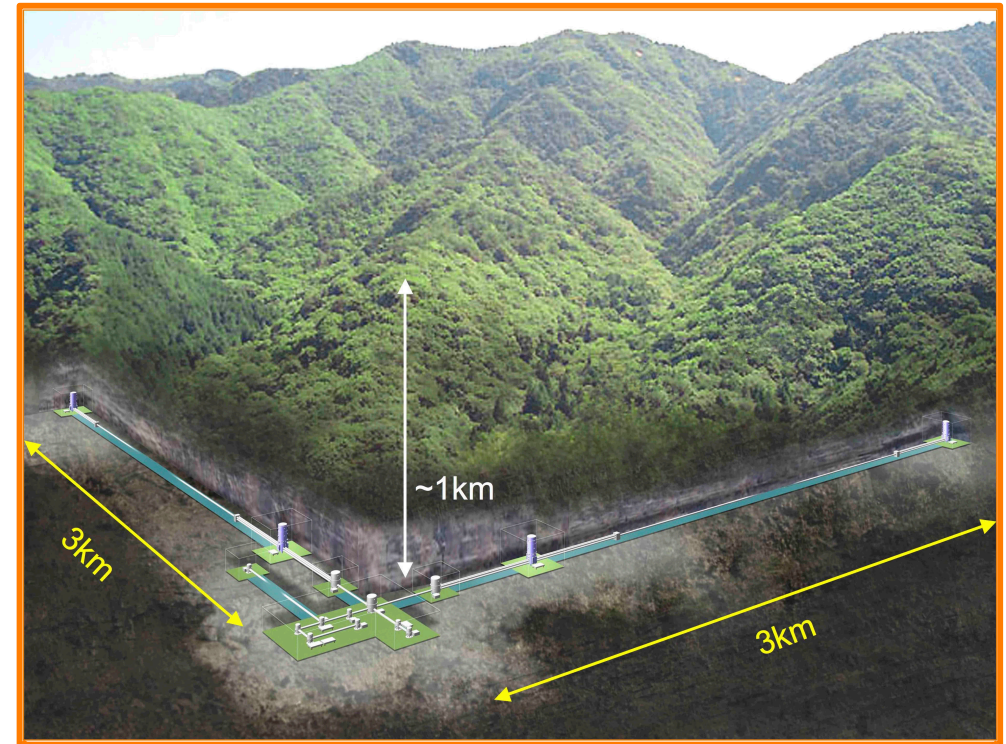
- Max sensitivity (M.S.): +13%
- Coverage at 0.5 M.S.: 100%
- 3 detector duty factor: 82%



B. F. Schutz

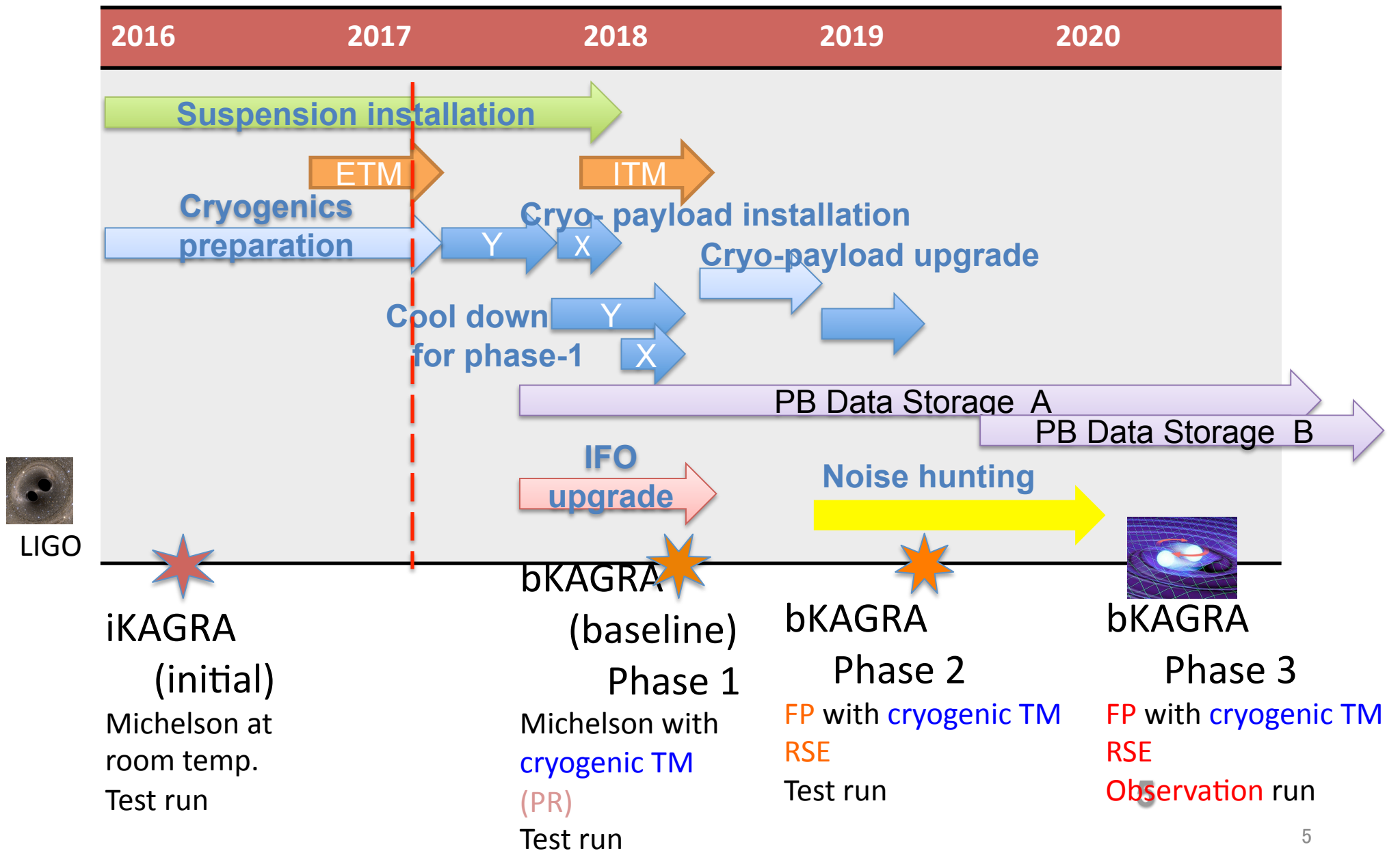
KAGRA

- Underground
 - Ikenoyama, Kamioka
 - small seismic
- 3km armlength
- Cryogenic test mass
 - cool down to 20K
 - sapphire substrate



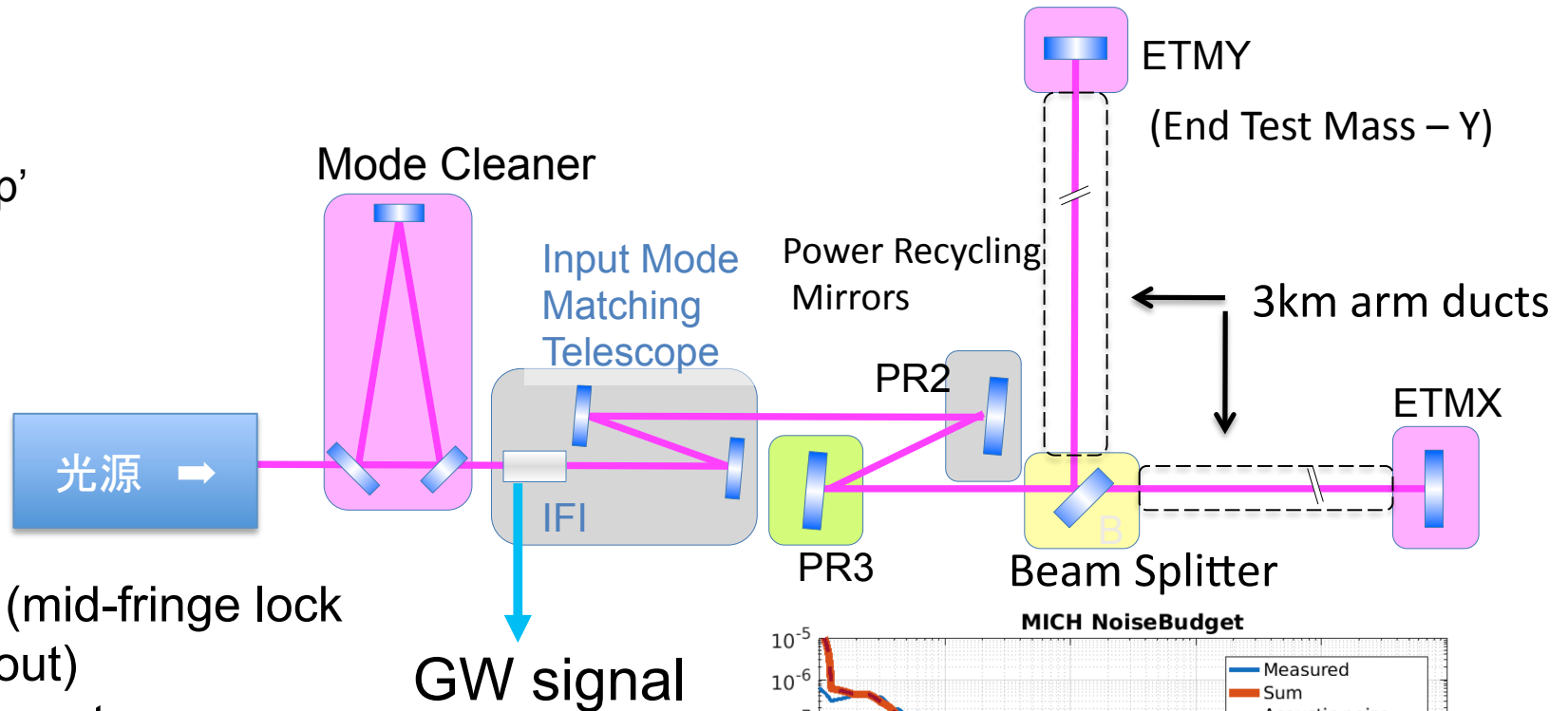
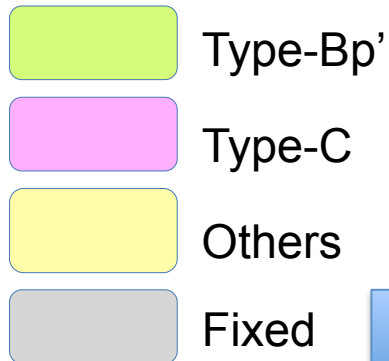
Construction started in 2010

Roadmap of KAGRA

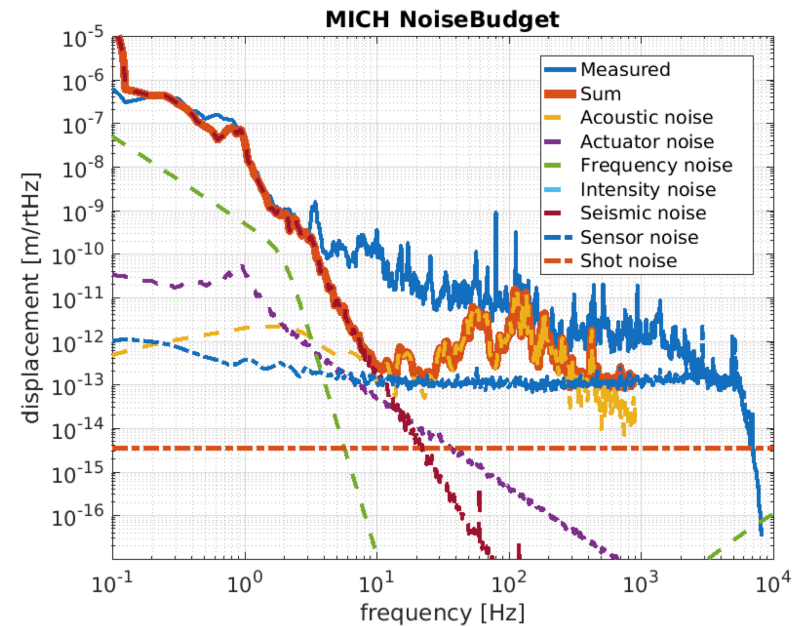


Configuration of iKAGRA (initial KAGRA) Test Run 2016 Mar. – Apr.

防振装置区分



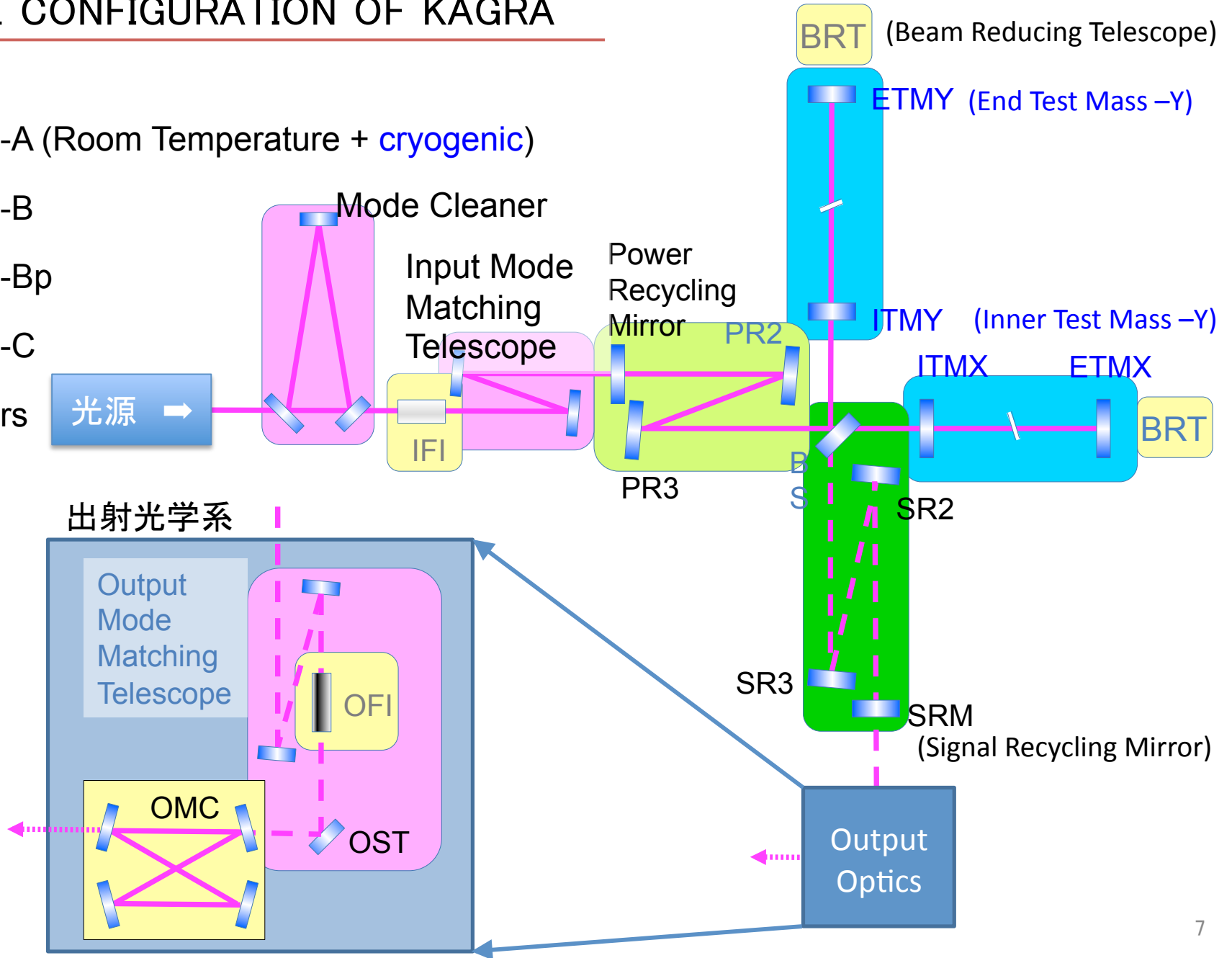
- Michelson (mid-fringe lock -> RF readout)
- Room Temperature
- Temporary Suspensions/ Mirrors
- 3km ducts were evacuated
- *Gain the experience of works in underground facilities*



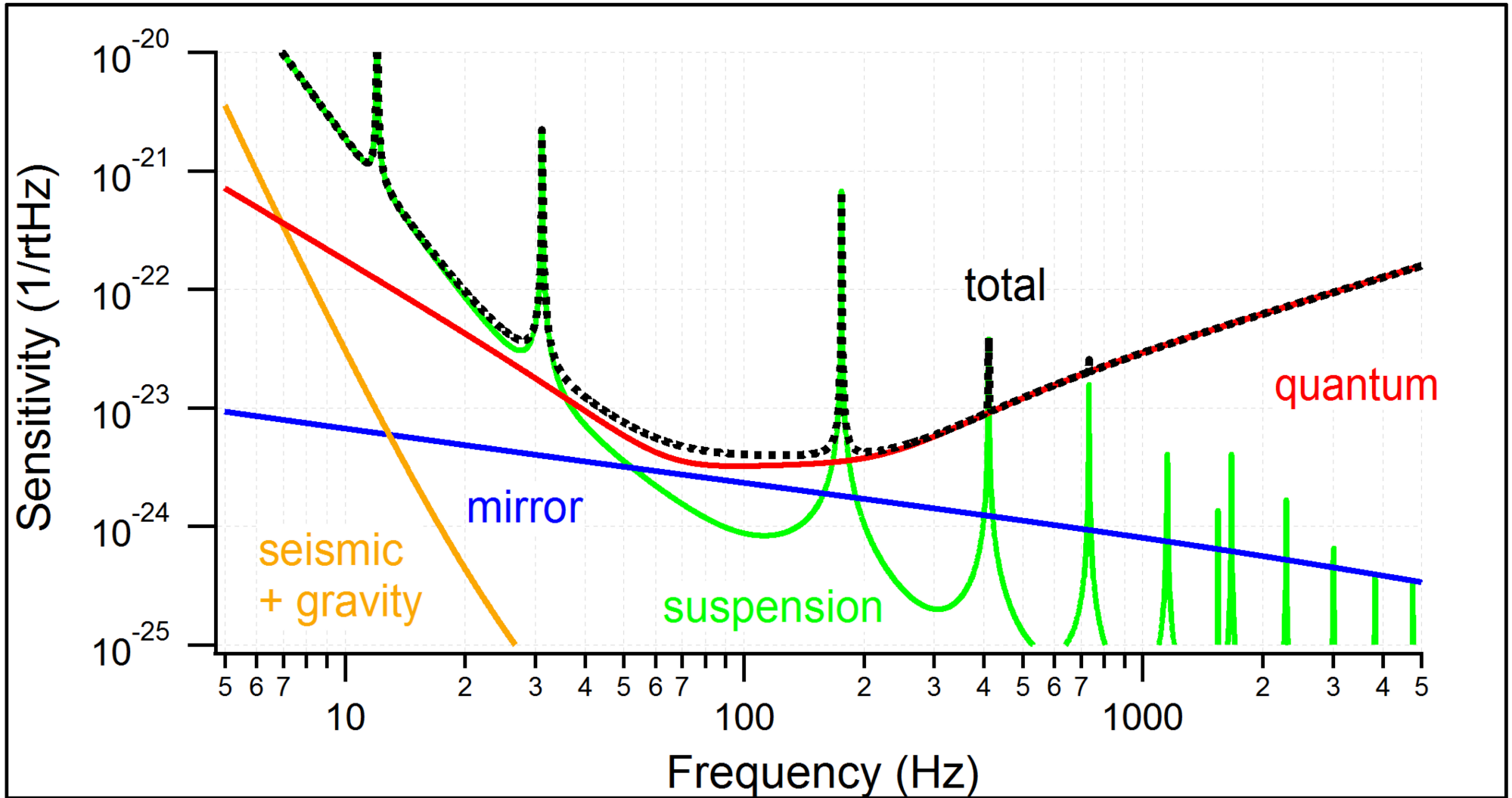
BASELINE CONFIGURATION OF KAGRA

防振装置区分

- Type-A (Room Temperature + **cryogenic**)
- Type-B
- Type-Bp
- Type-C
- Others



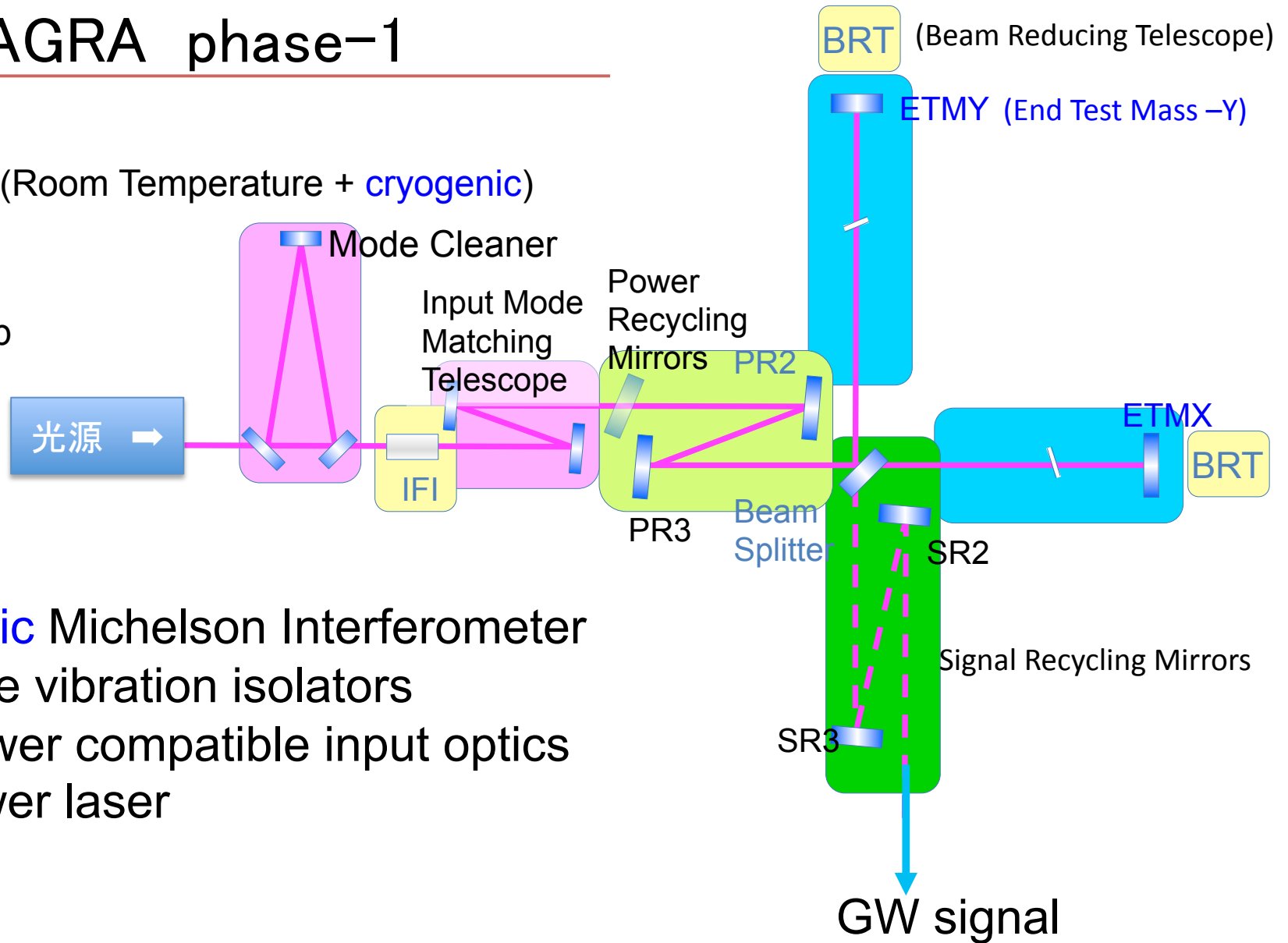
baseline sensitivity



bKAGRA phase-1

防振装置区分

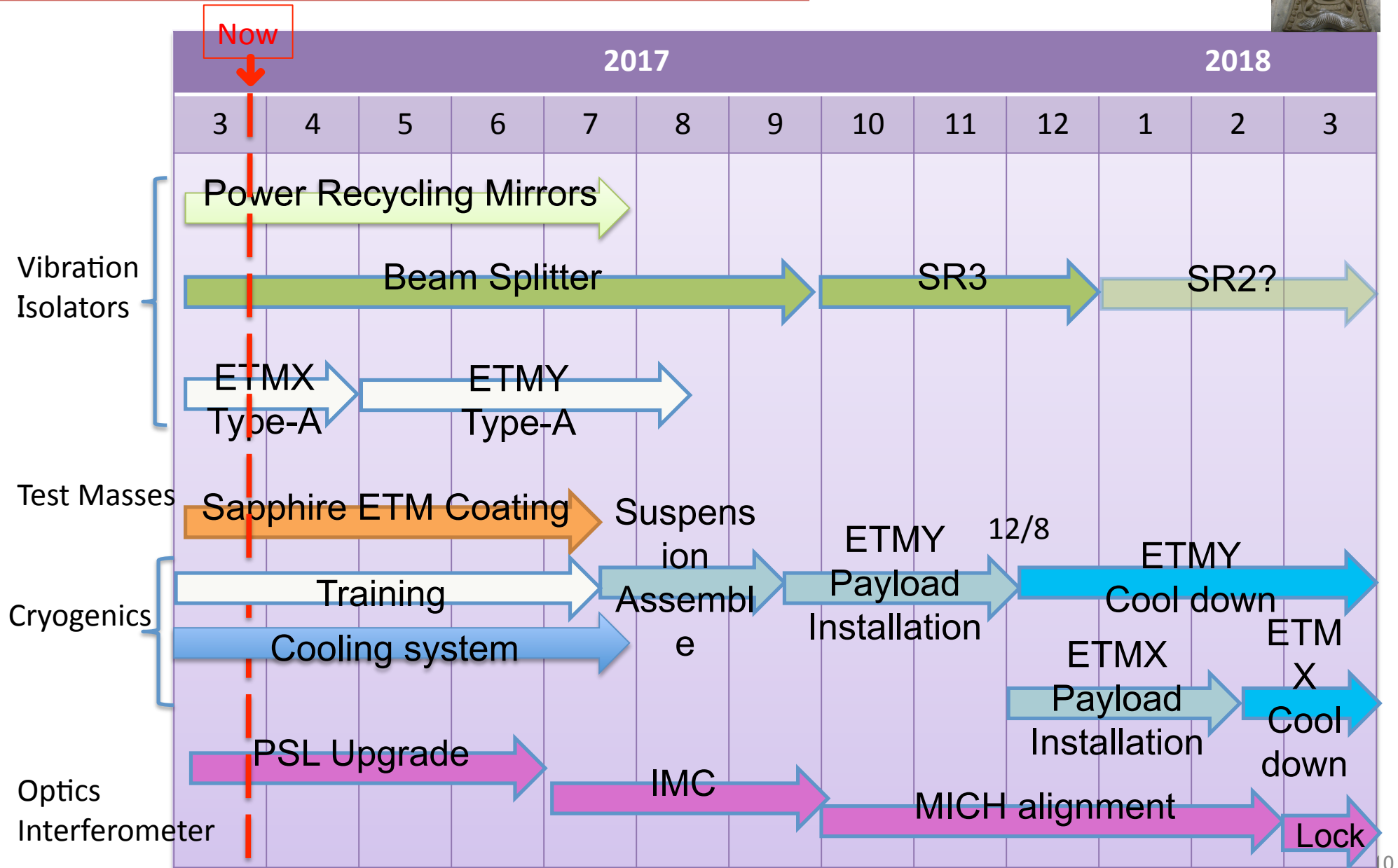
- Type-A (Room Temperature + **cryogenic**)
- Type-B
- Type-Bp
- Type-C
- Others



- **Cryogenic** Michelson Interferometer
- Full scale vibration isolators
- High power compatible input optics
- Low power laser

Start operation by the end of March 2018

bKAGRA PHASE 1 SCHEDULE



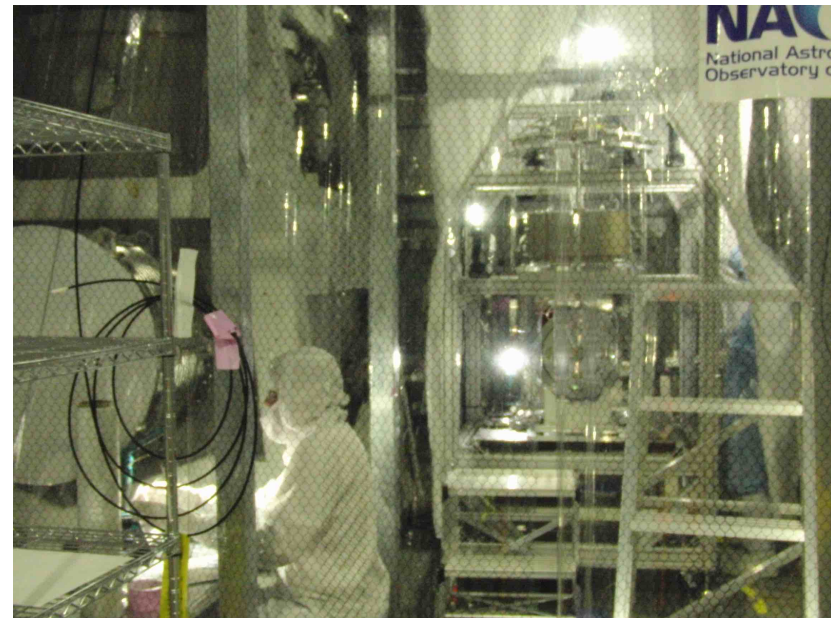
2017年2月～3月



Installation of type-A on 2nd store at Y-end



A small avalanche



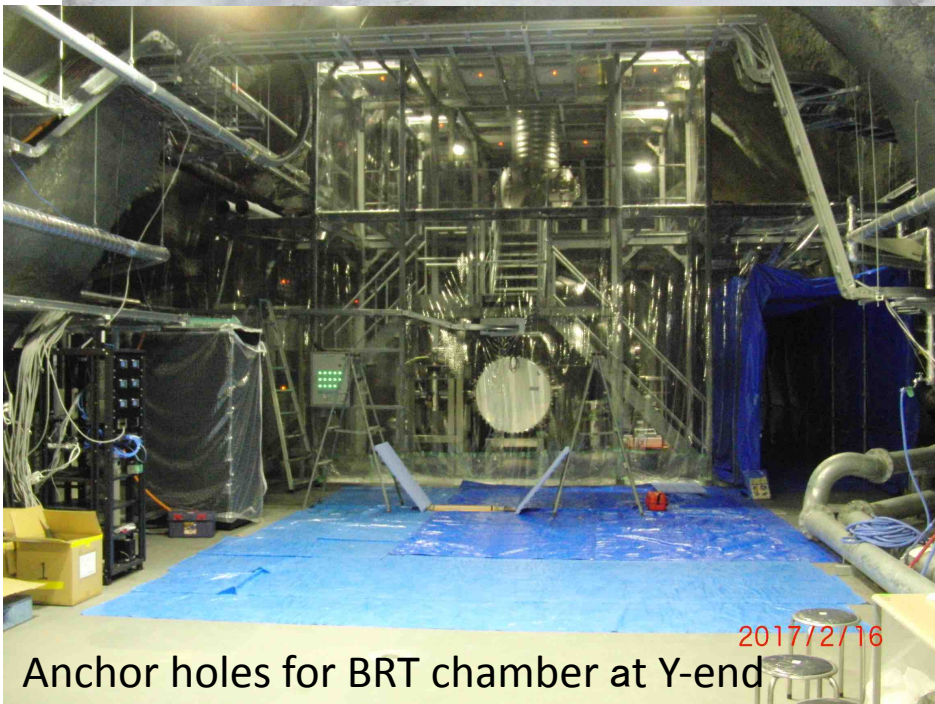
Installation of Beam Splitter



Road to Shin-Atotsu

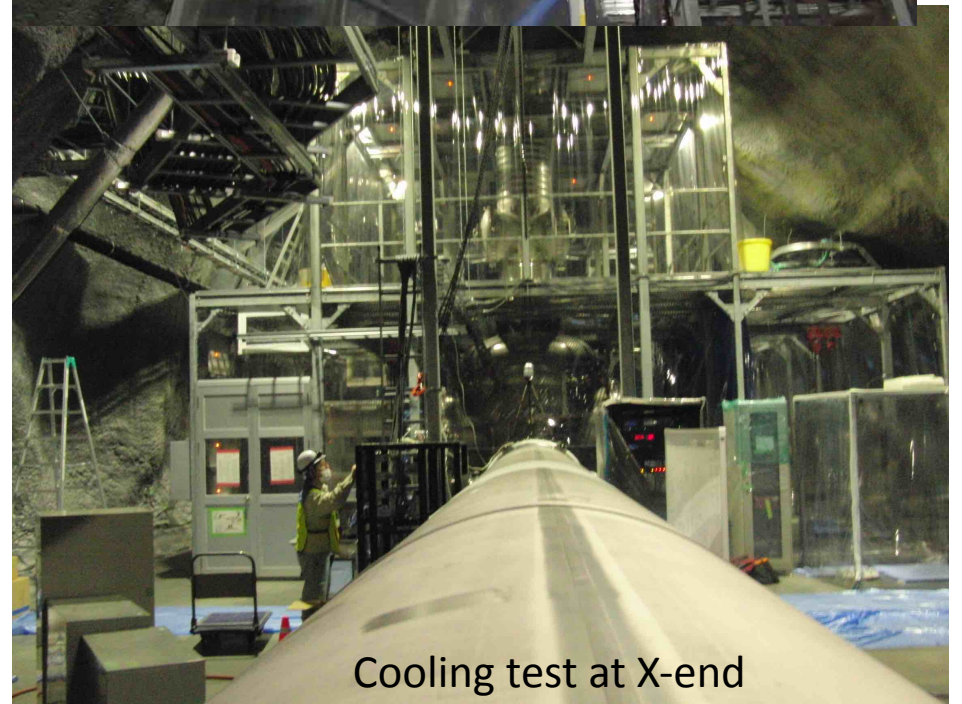


Installation of an optical bench



2017/2/16

Anchor holes for BRT chamber at Y-end



Cooling test at X-end

まとめ

- * bKAGRA (baseline KAGRA) phase-1 へ向けての準備、インストール作業が進行中
- * 各サブシステムの進捗については、この後の17aK25, 17pK25で、解析について17pK25, 18aK25での講演が予定されている。