# **Update on KAGRA instrument**

OpenLVKEM town hall, Jan. 26, 2023

## Digest for the past month

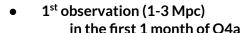
#### Good news

- Test run with the Fabry-Pérot Michelson (FPMI) was conducted at the year-end and new year's holidays. Results appear to be nice.
- Low-frequency noise is improved from O3GK
- To make the high-frequency noise better:
  - Commissioning for the realization of Power-Recycled FPMI (PRFPMI) is ongoing. The achievement is getting closer.
  - Higher-power laser will be installed soon.
  - etc.
- O Some level of cryo-cooling has already taken place.

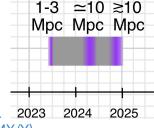
#### Bad news

- Bad weather:
  - Closure of the road to the observatory due to heavy snow (resolved)
  - Increased ground vibration in low frequency every winter season due to the rough seas in the nearby area of KAGRA.
- Accident:
  - In December, an instantaneous power failure occurred over a wide area that included KAGRA.

## **Timeline**







#### 1<sup>st</sup> mid-break

 Take a longer commissioning break to improve the detector's sensitivity.

### • 2<sup>nd</sup> observation (~10 Mpc) in the spring of 2024

- Resume the observation, 3 months-length at least.
- Cooling the test mass mirrors < 100 K at least.</li>
  (20K supposing full operation of cryocoolers)
- 2<sup>nd</sup> mid-break,
- 3<sup>rd</sup> observation (≥10 Mpc) at the end of extended O4.
  - Take another commissioning break to run several months of observation with higher sensitivity. (Still uncertain)