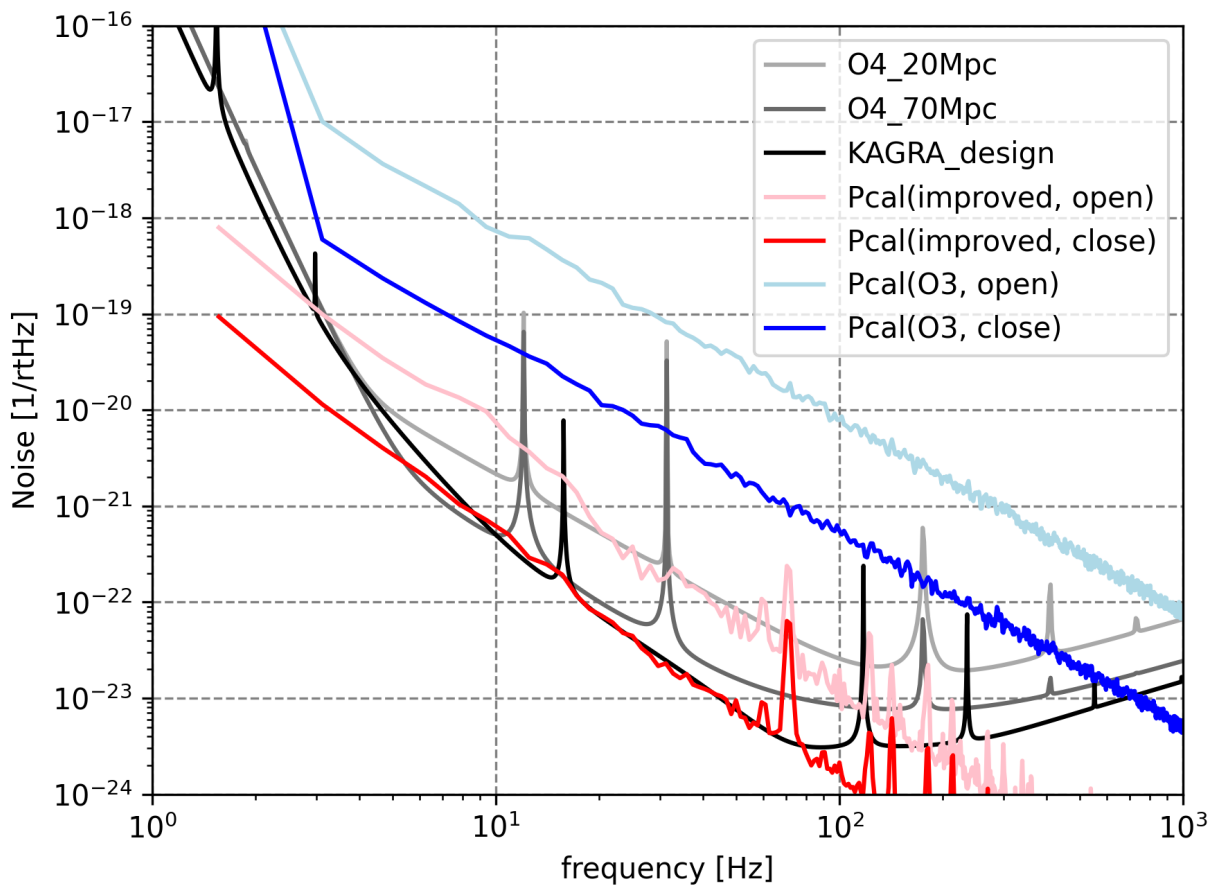


# Operations meeting January 21 2021 - KAGRA Calibration

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23:00(JST) / 22:00(TST)-

- Calibration Requirement Documents
  - <https://git.ligo.org/Calibration/documents/O4-requirements>
  - KAGRA CAL team is working to meet the requirements of systematic errors shown in the documents, such as:
    - Low latency: within 20% amplitude and 15 degrees phase between 20 and 1000 Hz
    - High latency: within ~10% amplitude and 10 degrees phase between 20 and 1000 Hz
- Man power issues
  - Currently, only two full-time researchers are available for CAL on-site works
  - We will work on high priority issues first to achieve the calibration requirement in O4
- Tasks and target time
  - Make Y-end Pcal working (- May/2021)
  - Pcal noise reduction (- Mar./2021)
  - Improve the WS calibration accuracy (- May/2021)
  - Fine alignment of the periscope with a pico-motor (-Jul.(X-end) and -Oct.(Y-end)/2021)
- Works done in the last month
  - X-end Pcal noise was significantly reduced (by 50 dB)
  - During O3 period, the noise was below KAGRA sensitivity but was still above O4.
  - The last OPamp in AI does not have enough power and when a long cable is attached the system makes the oscillation. To mitigate it, we inserted a register between AI and the long cables and attenuated the oscillation.
  - Now the noise is reduced and it satisfies the requirement of KAGRA O4 sensitivity.



- Working plan in the next months
  - Investigate and reduce the noise at Y-end Pcal (we hope the similar approach as X-end should work).
  - Insert baffles to reduce scattered light in Tx and Rx modules.
  - Install a pico-motor to one of the periscopes to precisely control the Pcal beam position onto the test mass
  - Establish Pcal beam alignment methods