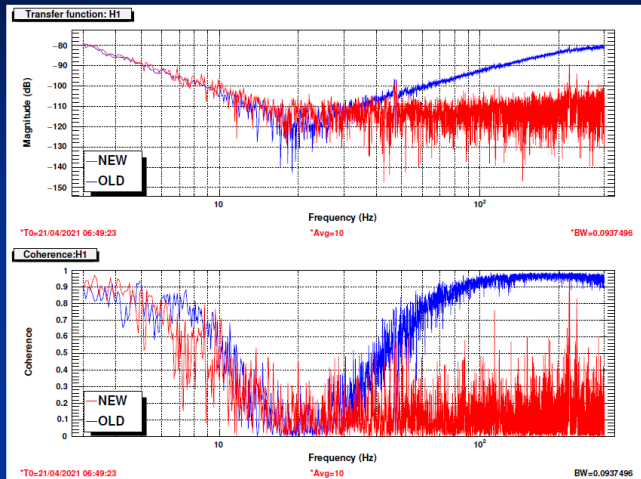


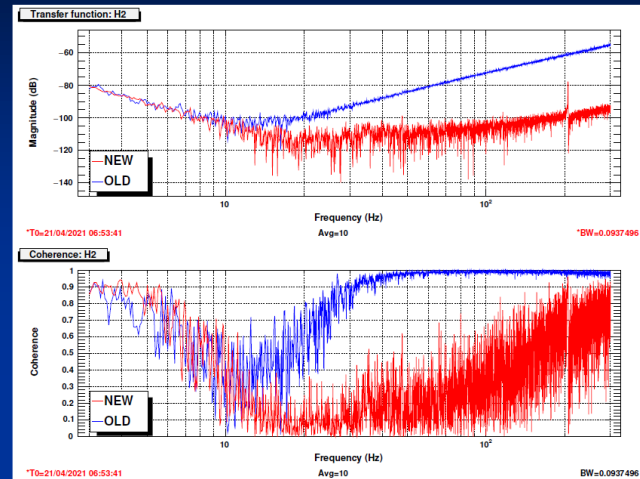


# Improvement of LVDT drivers for BF damper

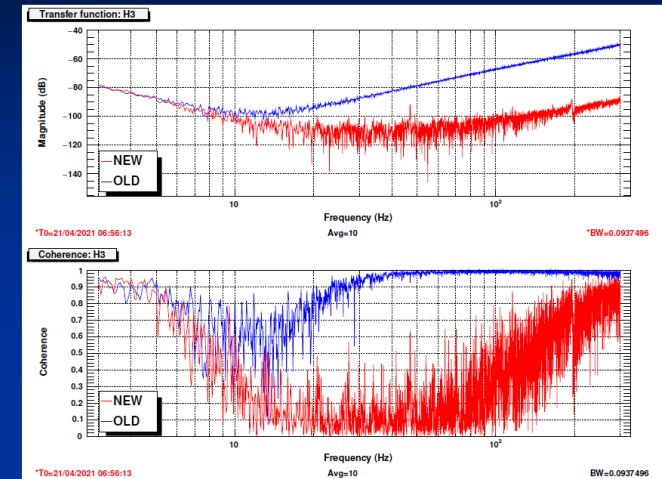
H1



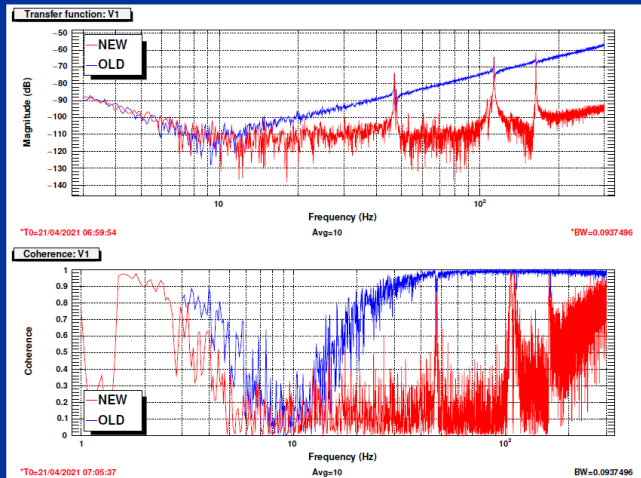
H2



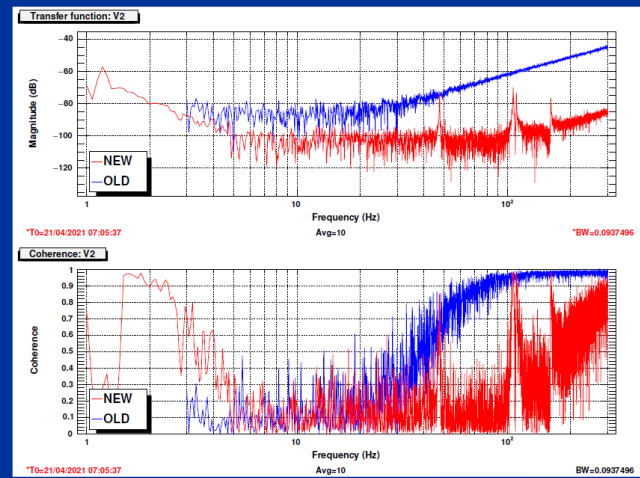
H3



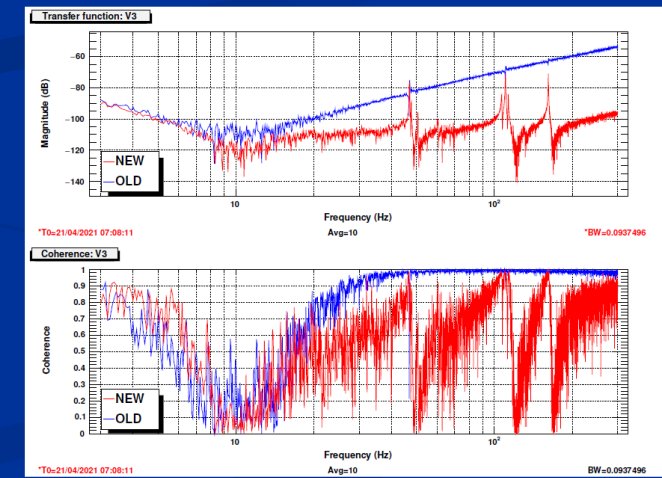
V1



V2



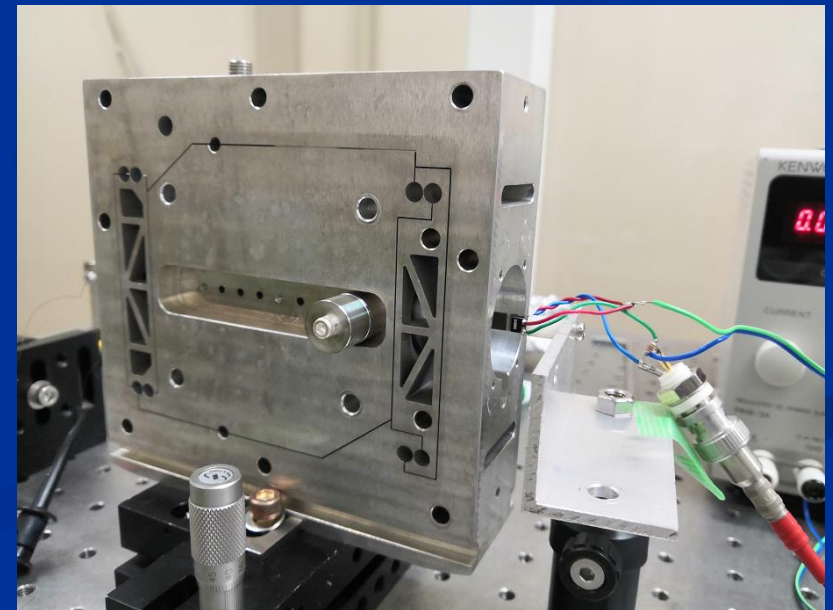
V3



Measured transfer functions from an actuator to the LVDT readout of the same channel. There is a dramatic improvement in eliminating the spurious coupling at high frequencies.

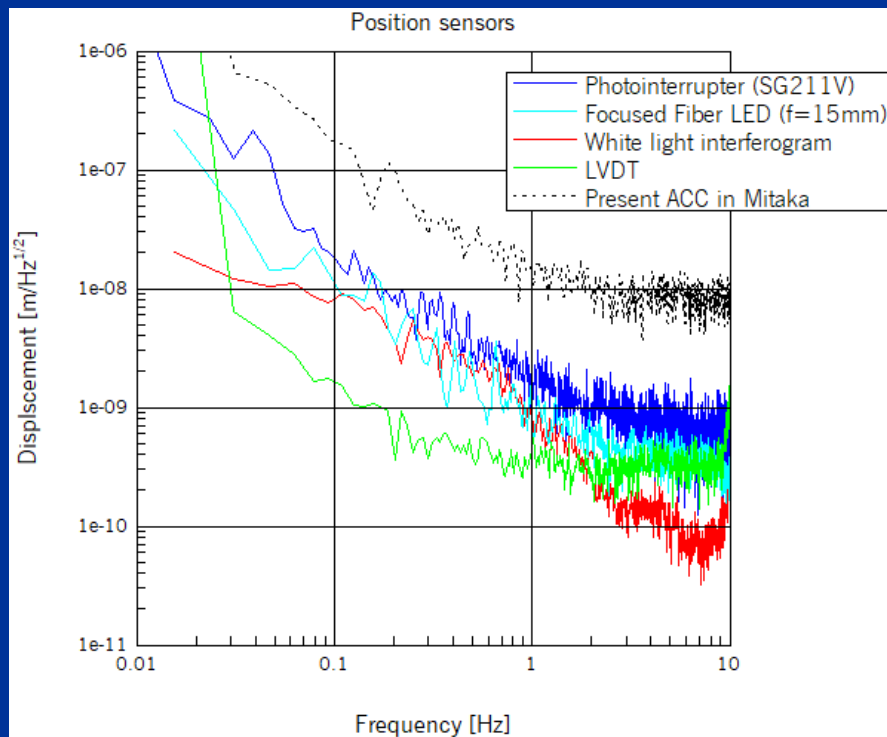
## Plan1-2. Improvement of inertial sensors for IP control

- The servo type accelerometers (IX, IY) and the commercial geophones (EX, EY) are used as inertial sensors in Type-A towers.
- The sensitivity of present inertial sensors are not good enough to control the IPs around 0.1Hz.
- We replace the inertial sensors to better accelerometers.
  - Replace the present position sensors.
  - Tune the folded pendulums to 0.2Hz.



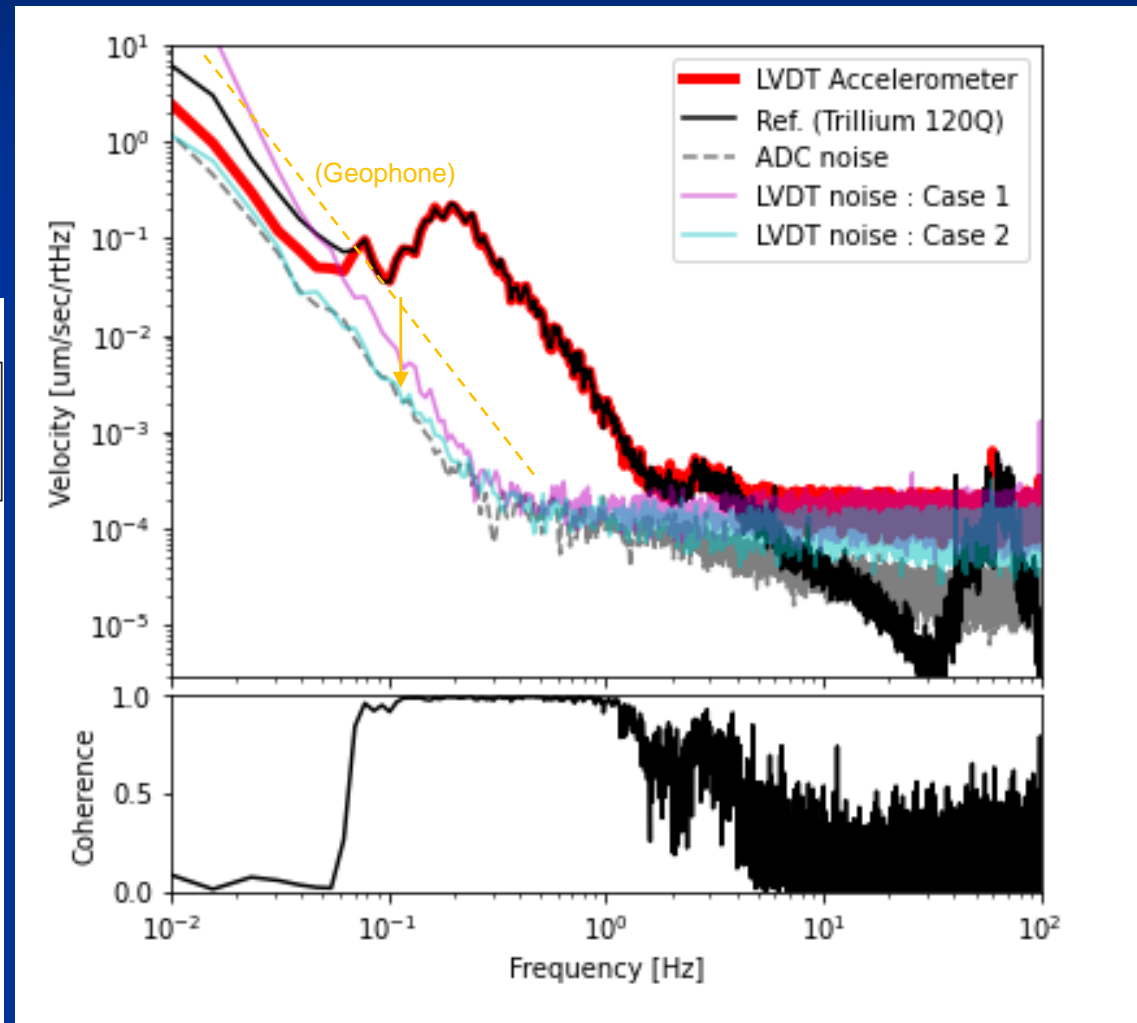
# Prototype test at the KAGRA site

- Some kinds of position sensors (photointerrupter, fiber LED, white light interferogram, and LVDT) have been evaluated. The LVDT had the best sensitivity around 0.1Hz.
- Prototype accelerometer with the LVDT was tested at the KAGRA site.



Sensitivities of some kinds of sensors

- One order improvement at 0.1Hz is expected.



Measured spectra at the KAGRA site

## Plan3-1: Replacement of GAS blades for F0 in IX/IY

- The F0 had overloaded by 4-10kg. The F0 keystones were fixed in O3. Three (of six) blades (for 297kg load) were replaced to strong blades (for 347kg load). The F0 can work as a vertical filter and the height of keystone became adjustable.

## Plan3-2. Extension of adjustable range for F0 in IX/IY

- The F0 was tuned to 0.2Hz (as single pendulum). The adjustable range was extended to more than +/- 3.5mm.

