Optimal Sensor Fusion using H-infinity Synthesis
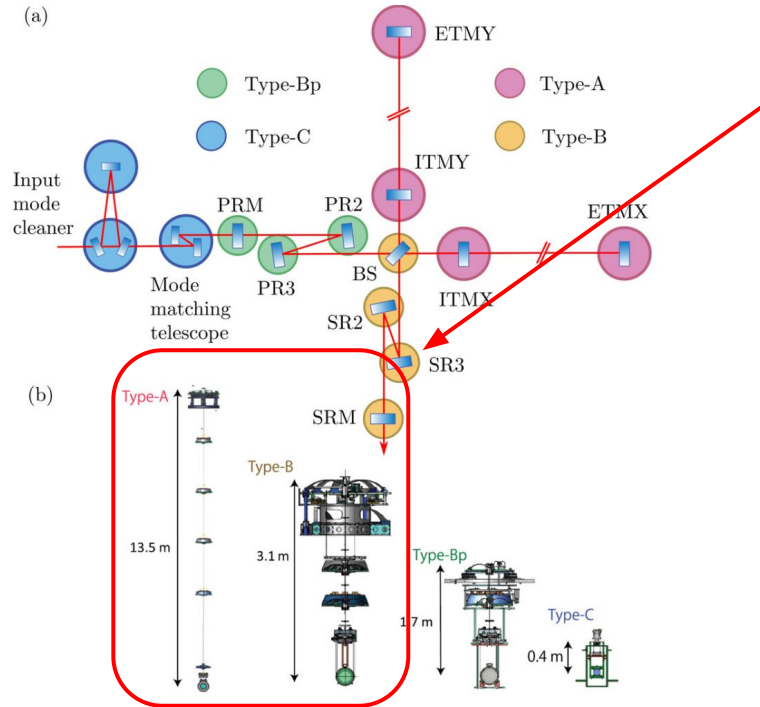
Terrence Tak Lun TSANG
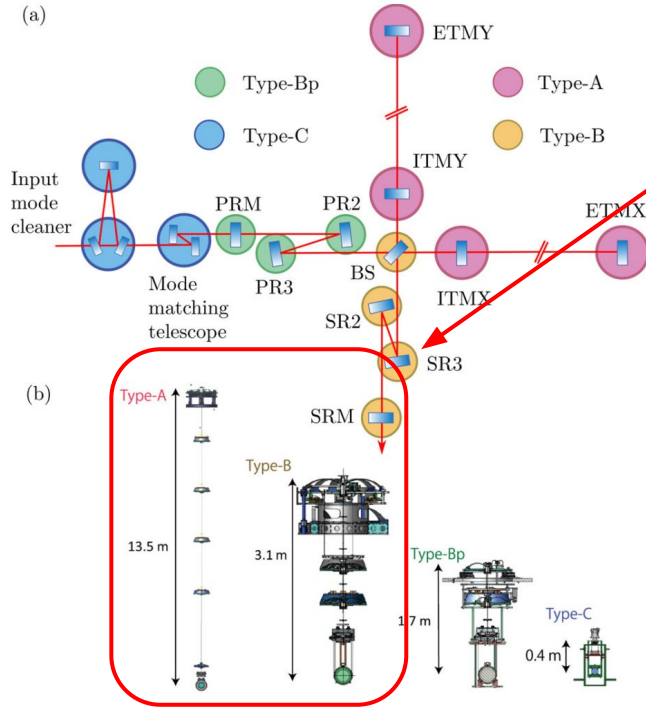on behalf of the KAGRA Collaboration

KAGRA 27th F2F meeting

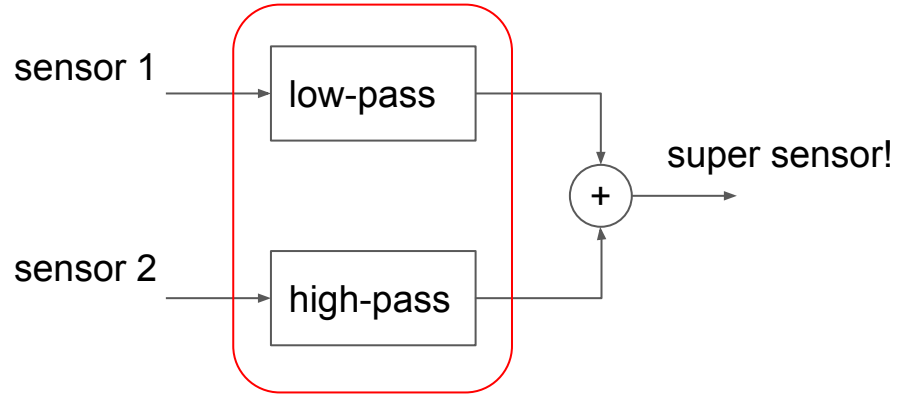# Sensor Fusion using Complementary Filters

- These use feedback control to actively isolate seismic noise at lower frequencies.

- Performance is ultimately limited by sensor noise.

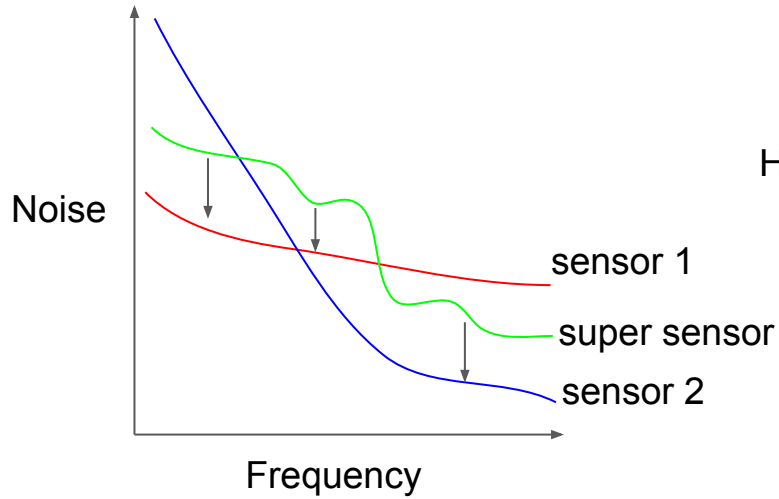# Sensor Fusion using Complementary Filters

Two types of sensors at the pre-isolator
1. relative displacement sensors (LVDT)
2. inertial sensors (geophone or accelerometer)

Complementary filters

How to design?

The Method in a Nutshell

Noise

sensor 1

super sensor

sensor 2

Frequency

H_∞ Optimization

Noise

super sensor noise close to the lower bound.

Frequency