

Vibration Measurement of ATF2 Q-mag Installed and Future Plan

**Measured by R. Sugahara, M. Masuzawa
and Y. Ohsawa on 20 September 2007**

Vibration of QF17X,

**newly installed IHEP magnet in the ATF2 beam line
inside the ATF ring**

without FFTB mover

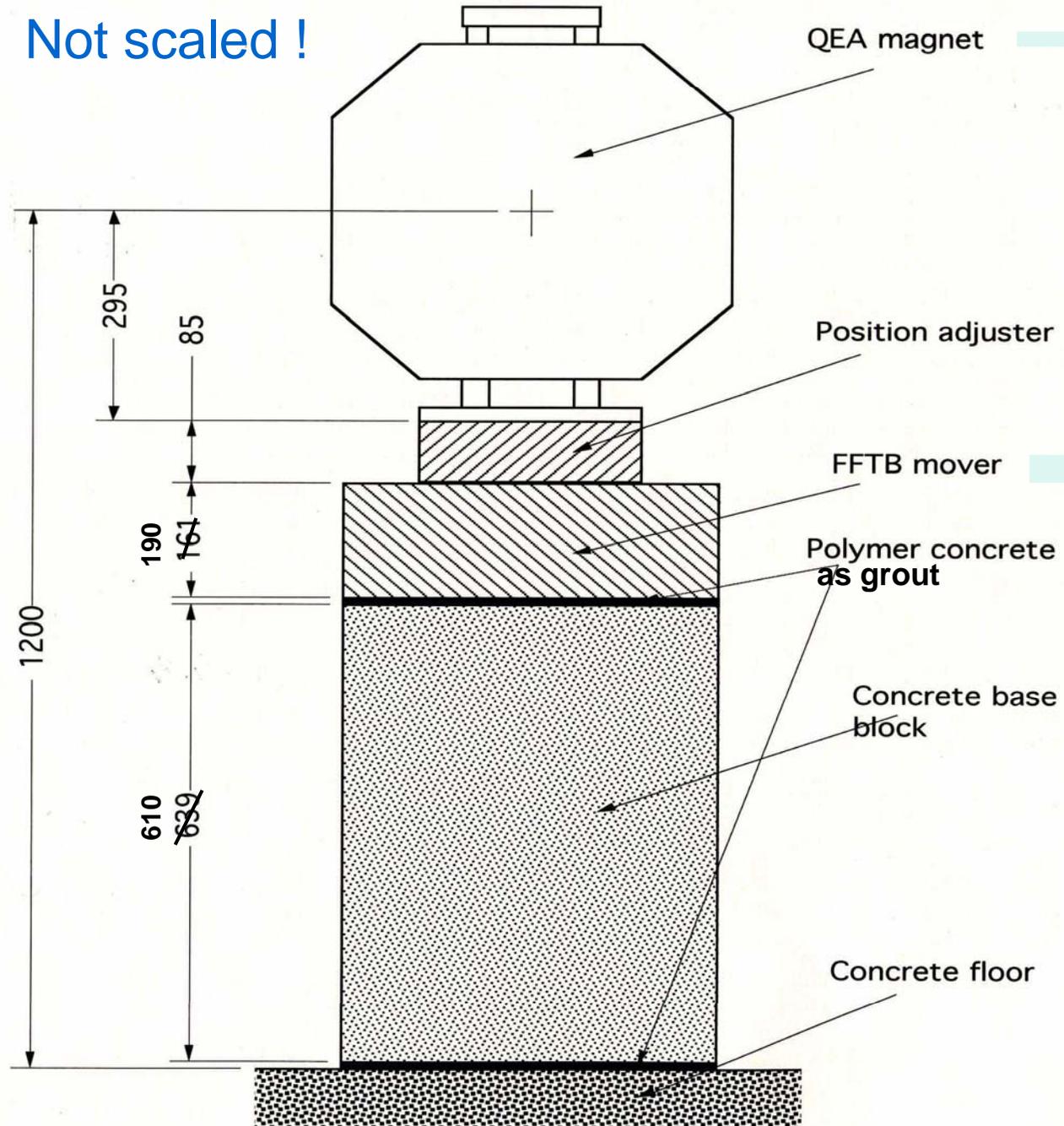
Definition of the coordinate system

X: N – S, perpendicular to the ATF2 beam line

Y: E – W, along the ATF2 beam line

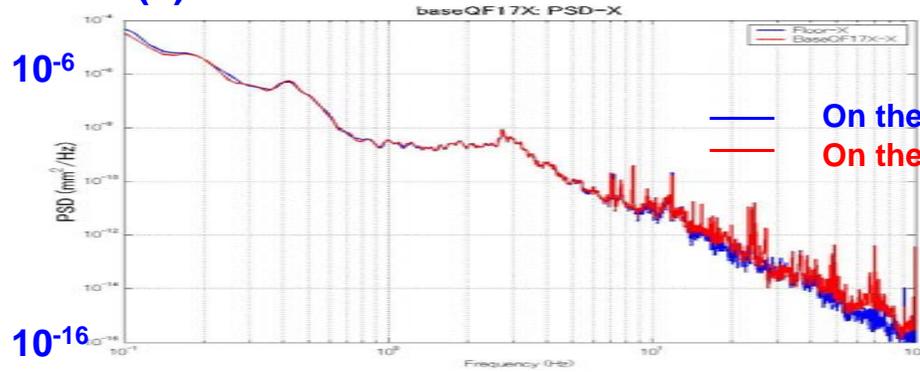
V: vertical direction

Not scaled !

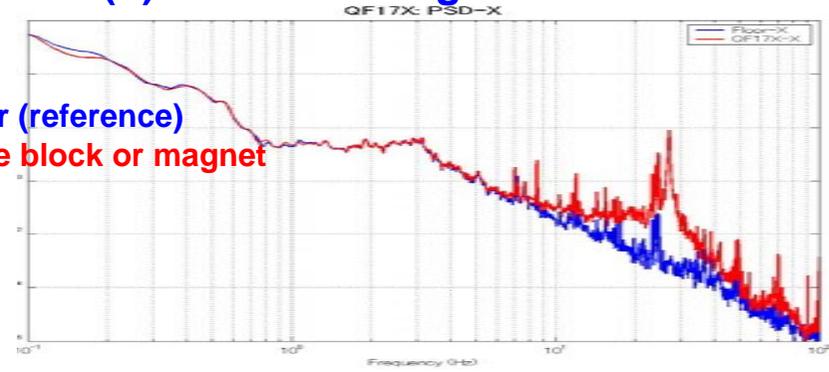


PSD for QF17X

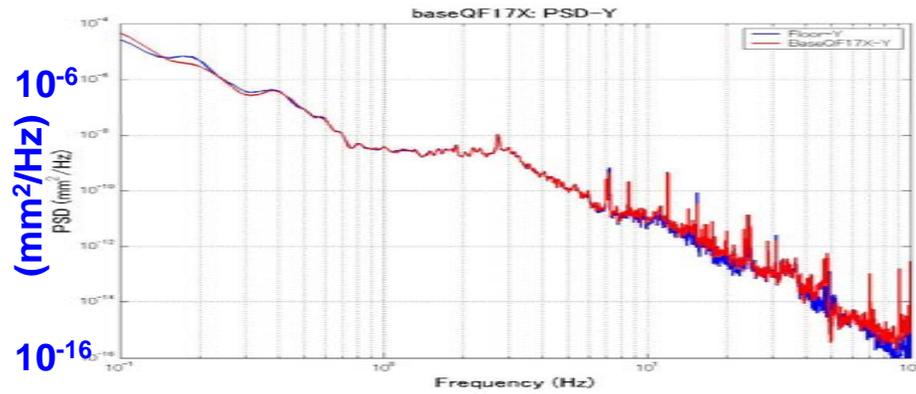
(a) PSD-X on concrete base block



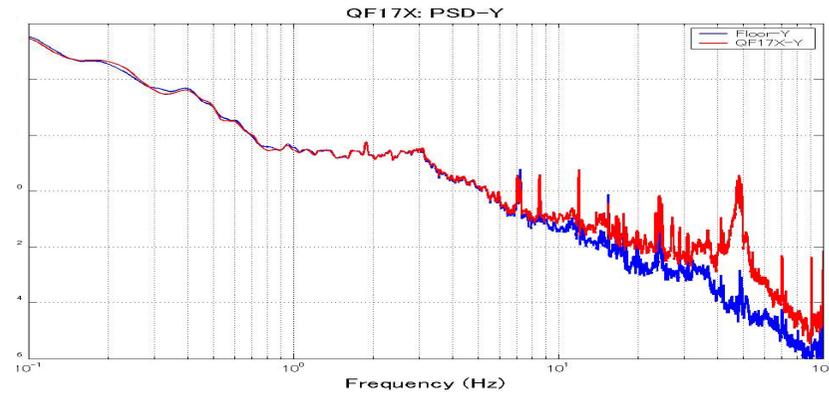
(d) PSD-X on magnet



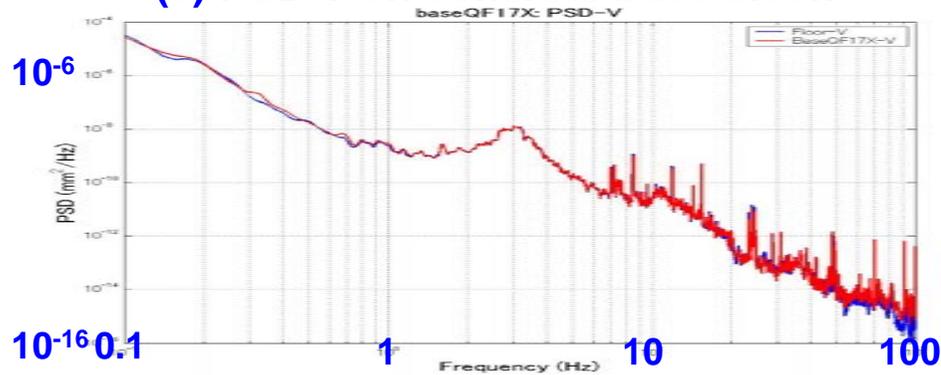
(b) PSD-Y on concrete base block



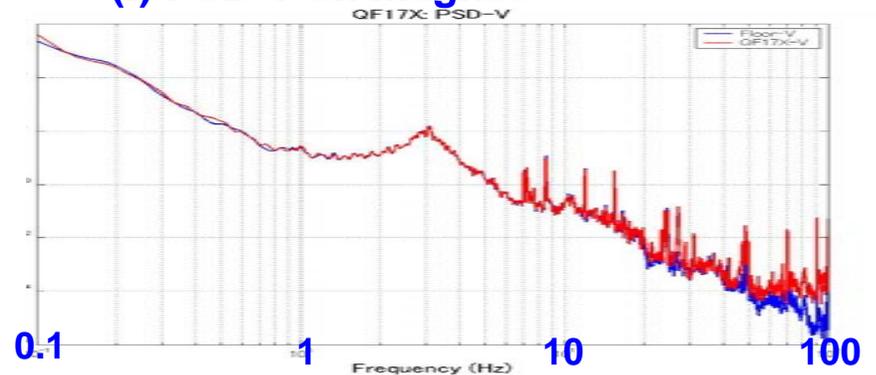
(e) PSD-Y on magnet



(c) PSD-V on concrete base block

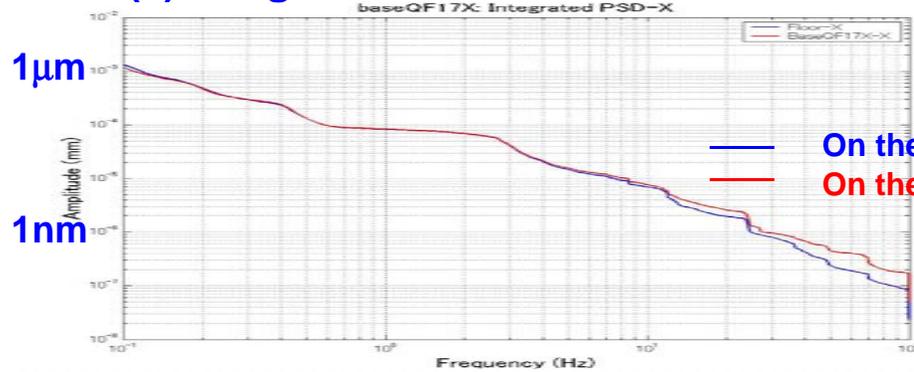


(f) PSD-V on magnet

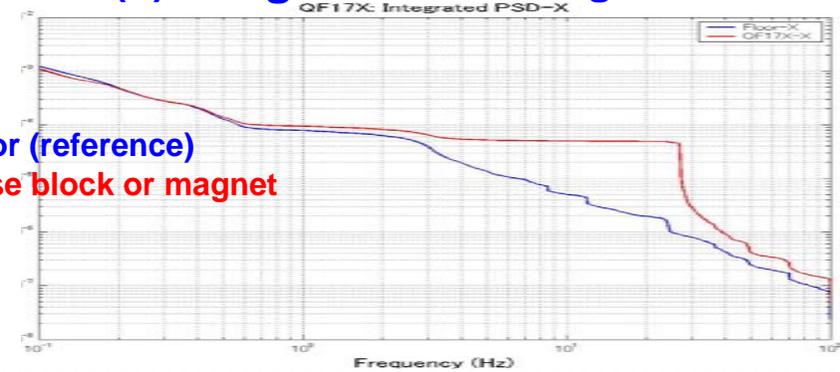


Integrated PSD for QF17X

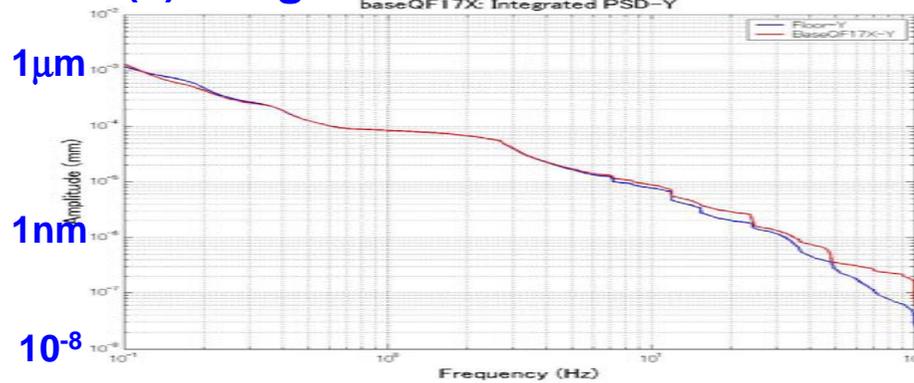
(a) Integ. PSD-X on concrete base block



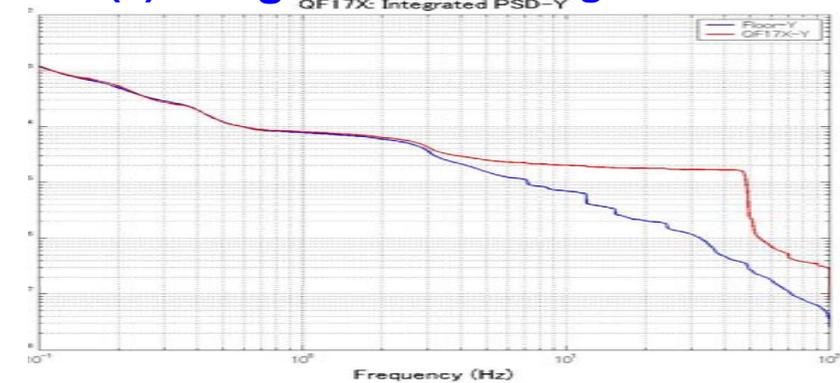
(d) Integ. PSD-X on magnet



(b) Integ. PSD-Y on concrete base block



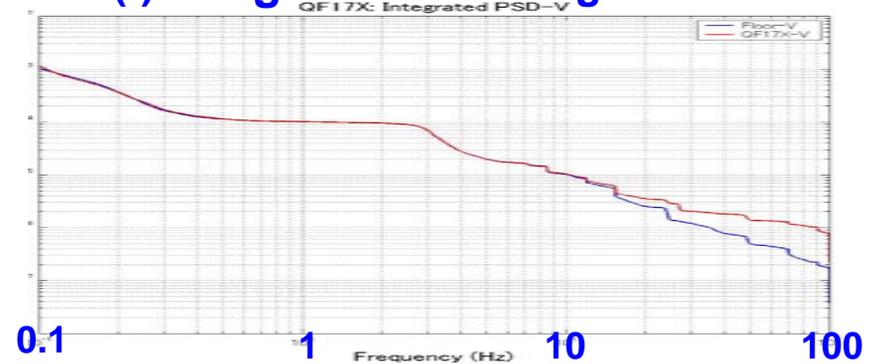
(e) Integ. PSD-Y on magnet



(c) Integ. PSD-V on concrete base block



(f) Integ. PSD-V on magnet



Comparison between QF17X and XQ16

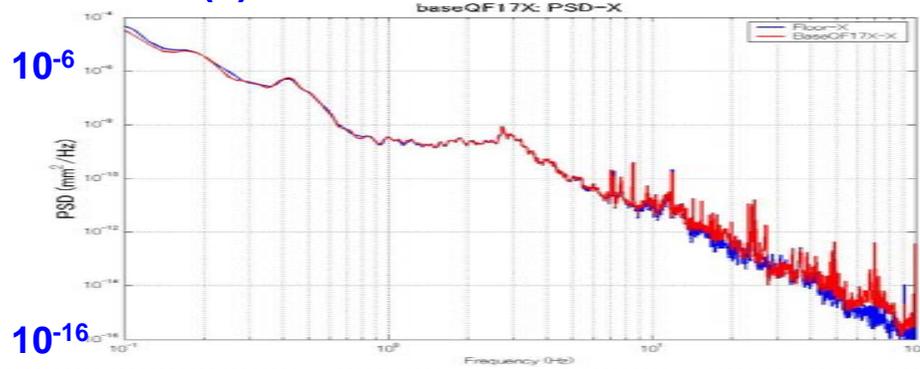
XQ16 is an IHEP magnet installed in the current beam extraction line

with FFTB mover,

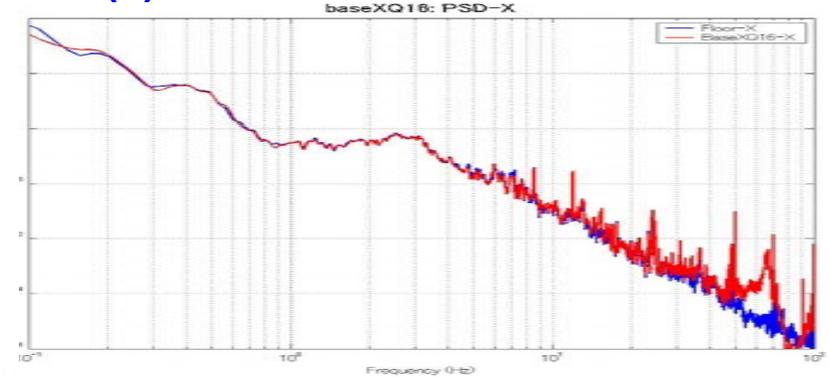
**and concrete base block is bolted to the floor
(no polymer concrete used)**

PSD on Concrete Base Blocks of QF17X and XQ16

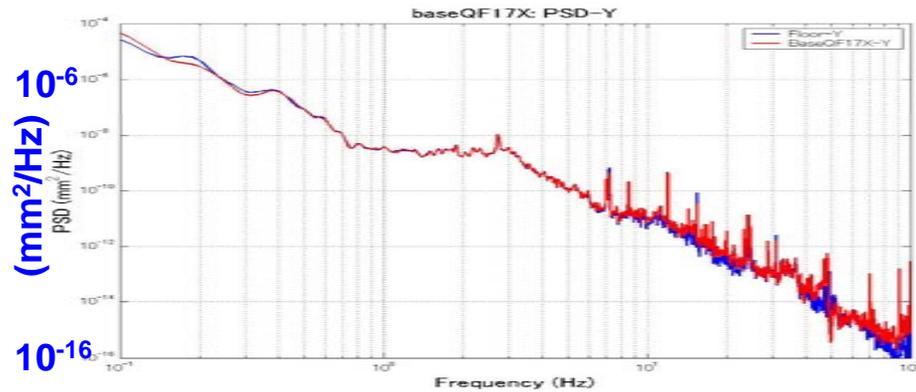
(a) PSD-X on c.b.b. of QF17X



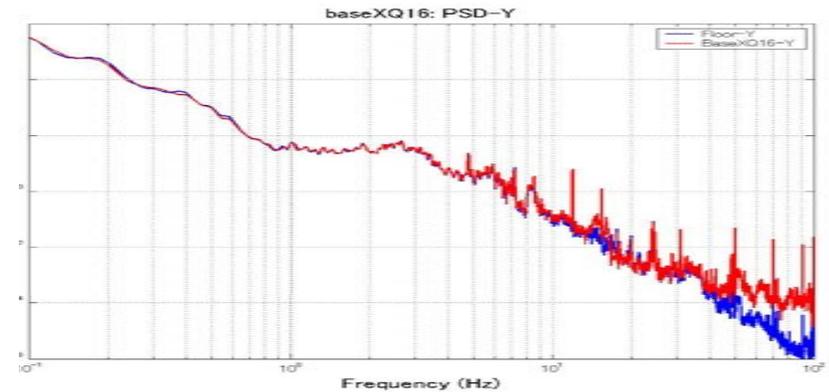
(d) PSD-X on c.b.b. of XQ16



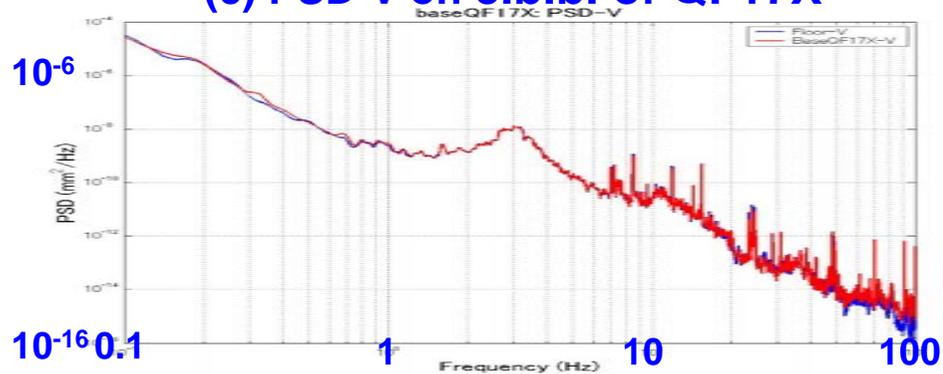
(b) PSD-Y on c.b.b. of QF17X



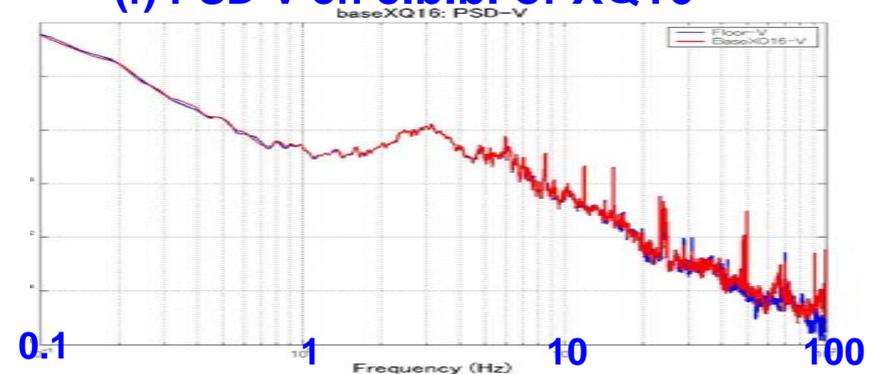
(e) PSD-Y on c.b.b. of XQ16



(c) PSD-V on c.b.b. of QF17X

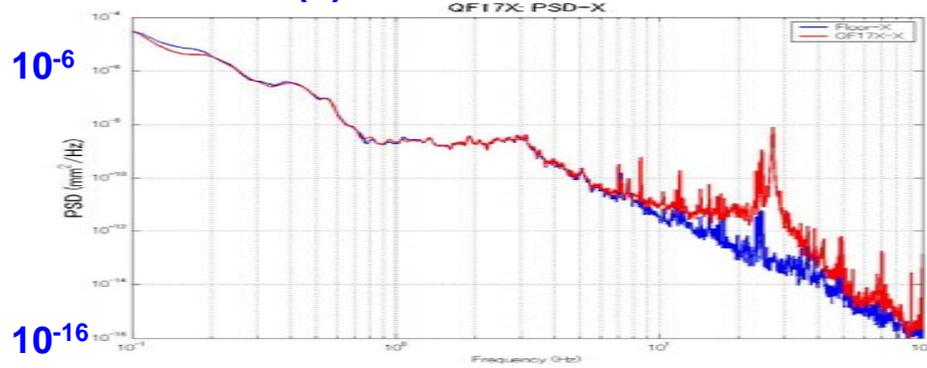


(f) PSD-V on c.b.b. of XQ16

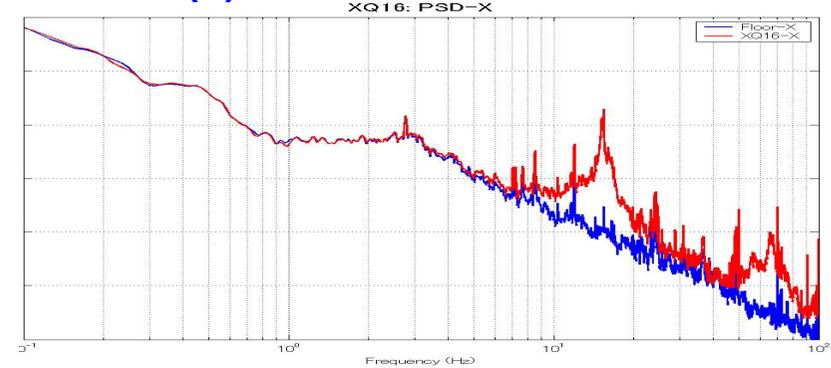


PSD on QF17X and XQ16

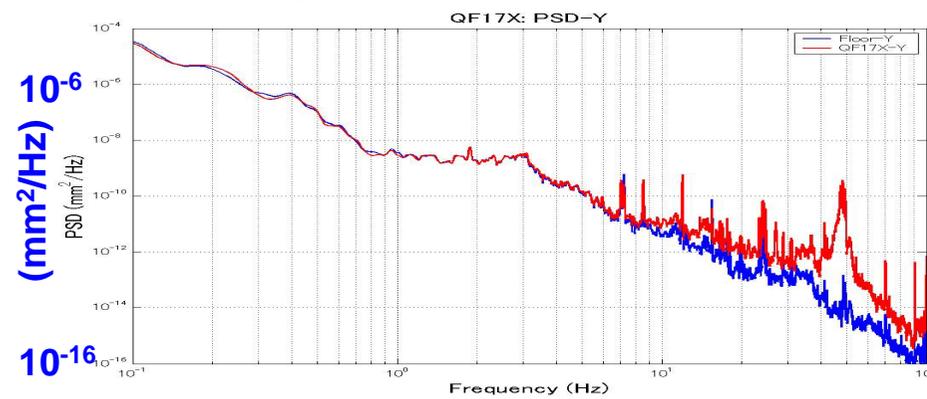
(a) PSD-X on QF17X



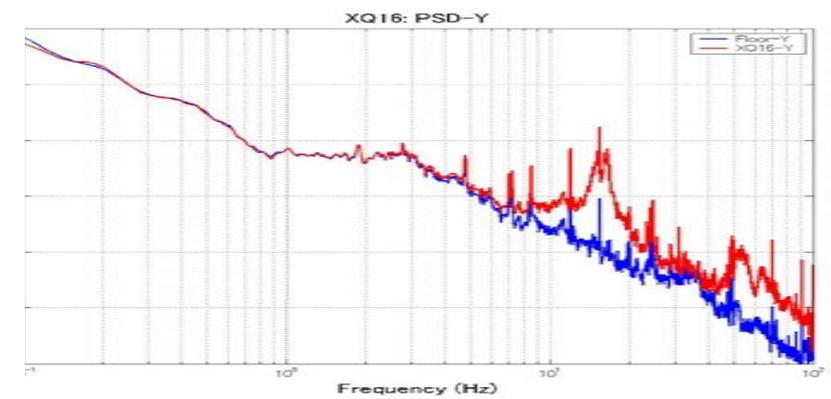
(d) PSD-X on XQ16



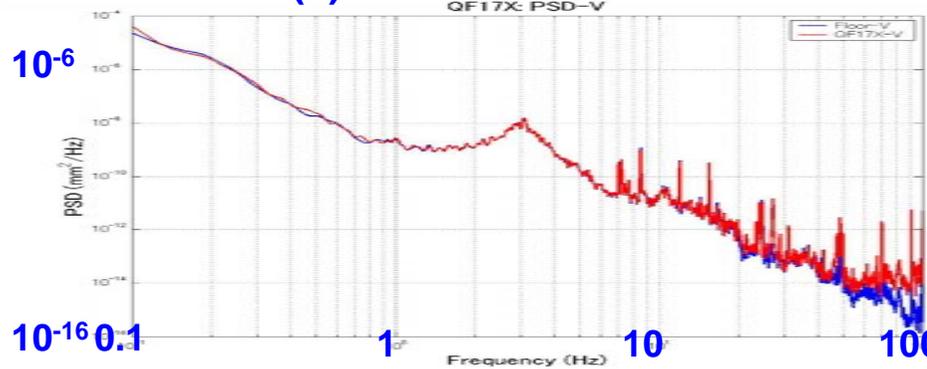
(b) PSD-Y on QF17X



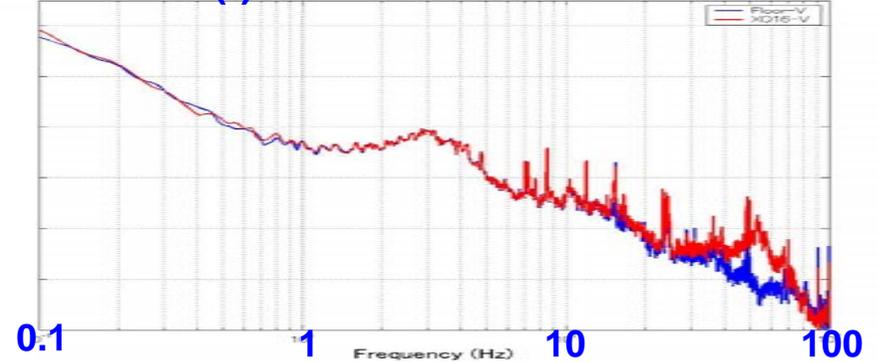
(e) PSD-Y on XQ16



(c) PSD-V on QF17X

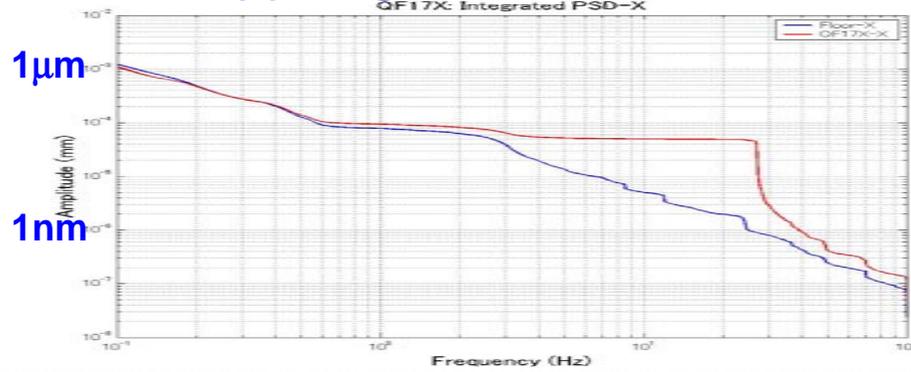


(f) PSD-V on XQ16

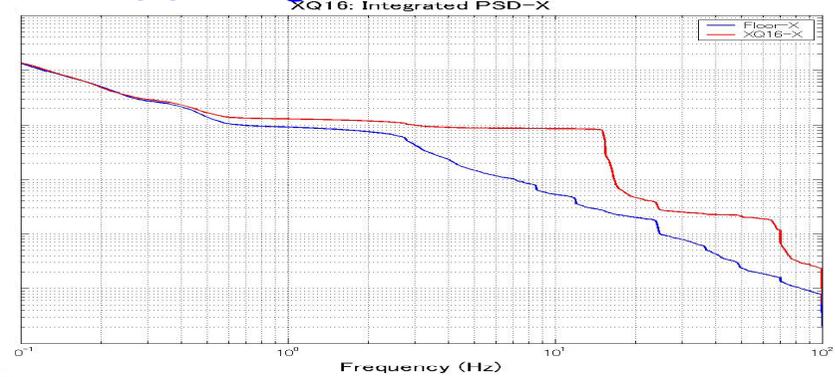


Integrated PSD for QF17X and XQ16

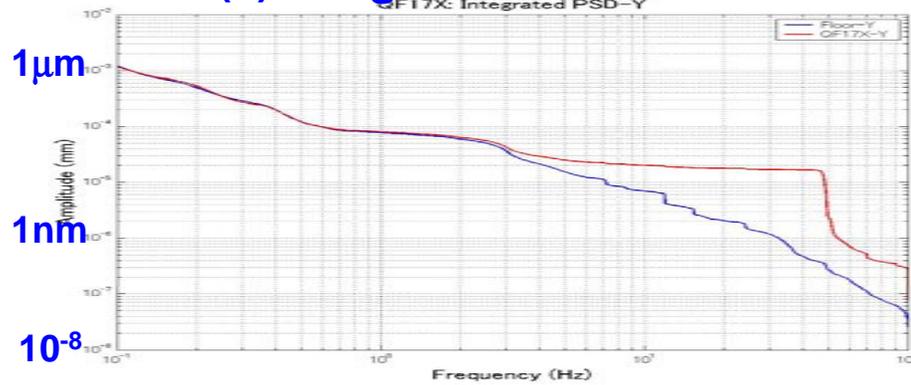
(a) Integ. PSD on QF17X



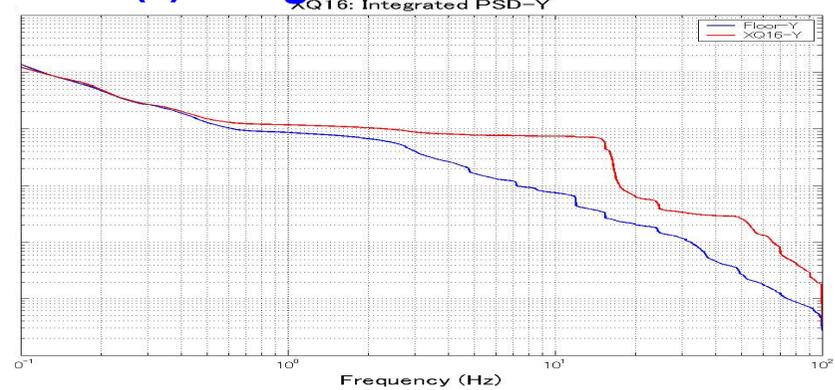
(d) Integ. PSD-X on XQ16



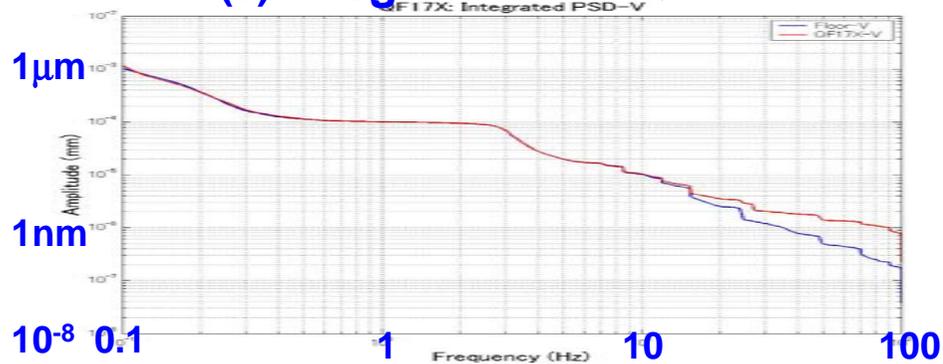
(b) Integ. PSD-Y on QF17X



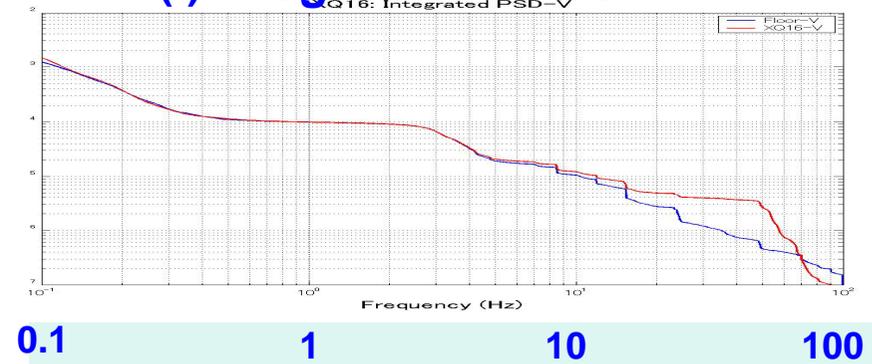
(e) Integ. PSD-Y on XQ16



(c) Integ. PSD-V on QF17X



(f) Integ. PSD-V XQ16



Summary

QF17X

Concrete base block was fixed with polymer concrete to the floor

No FFTB mover

- No amplification of the floor vibration on the concrete base block
- On the magnet, resonant vibration was observed at
~27Hz in X and ~50Hz in Y direction
Amplitude at these peaks are 50nm and 20nm, respectively

XQ16

Concrete base block was bolted to the floor (no polymer concrete)

Magnet is placed on the FFTB mover

- Some amplification of the floor vibration was observed in horizontal direction on the concrete base block in high frequency region (50 - 70 Hz), but the amplitude is small
- On the magnet, resonant vibration was observed at
~14Hz in X and Y direction and ~55Hz in V direction
Amplitude at these peaks are 100nm at 14Hz and 4nm at 55Hz, respectively

Future Plan

- **Vibration measurement with seismometers at new ATF2 beam line and comparison with that in the ATF Ring.**
- **Floor movement measurement with HLS system.**
- **Measurement of daily variation of the floor tilt.**