

Ground Motion in Hard and Soft Ground Area

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Ground motion in various grounds

(1) **KEK site** soft ground

- Diluvium in Kanto plane
(alternative layers of sand, gravels and clay)
- Measured on the ground surface and in the KEKB accelerator tunnel (10m deep underground)
- There is a main public road about 1km far from the measurement place.

(2) **SPring-8** (8 GeV synchrotron light source lab.)

- constructed on hard bedrock
- Kamigori metagabbro rock area
- Measured on the bedrock near to the accelerator ring
- > Amplitude of GM was smaller than resolution of the detector, VSE355G2 of Tokyo Sokushin.

(3) Mitsuse road tunnel in Sefri area granite rock area

- Penetrating Sefuri mountain chain (granite rock)
- Located in border between Fukuoka and Saga prefectures
- Measured at a point about 10m far from near edge of the road on the concrete floor in a shelter area, which is located about 800m inner from the entrance of the tunnel.

(4) Esashi area granite rock area

- Measured in Mizusawa Earth Tide Observatory
About 150m long horizontal tunnel constructed in Abara mountain (granite rock)
- Measuremed on a granite base plate fixed on the bedrock.

Instruments

VSE355G2 of Tokyo Sokushin Co., Ltd.

Velocity sensor

Used in **KEK and SPring-8** areas

f-range 0.012 - 70Hz

Output 2.5V/kine

STS-2 of Streckeisen

Velocity sensor

Used in **Sefuri and Esashi** areas

f-range 0.008 - 50Hz

Output 7.5V/kine (15V/kine)

* kine = cm/sec

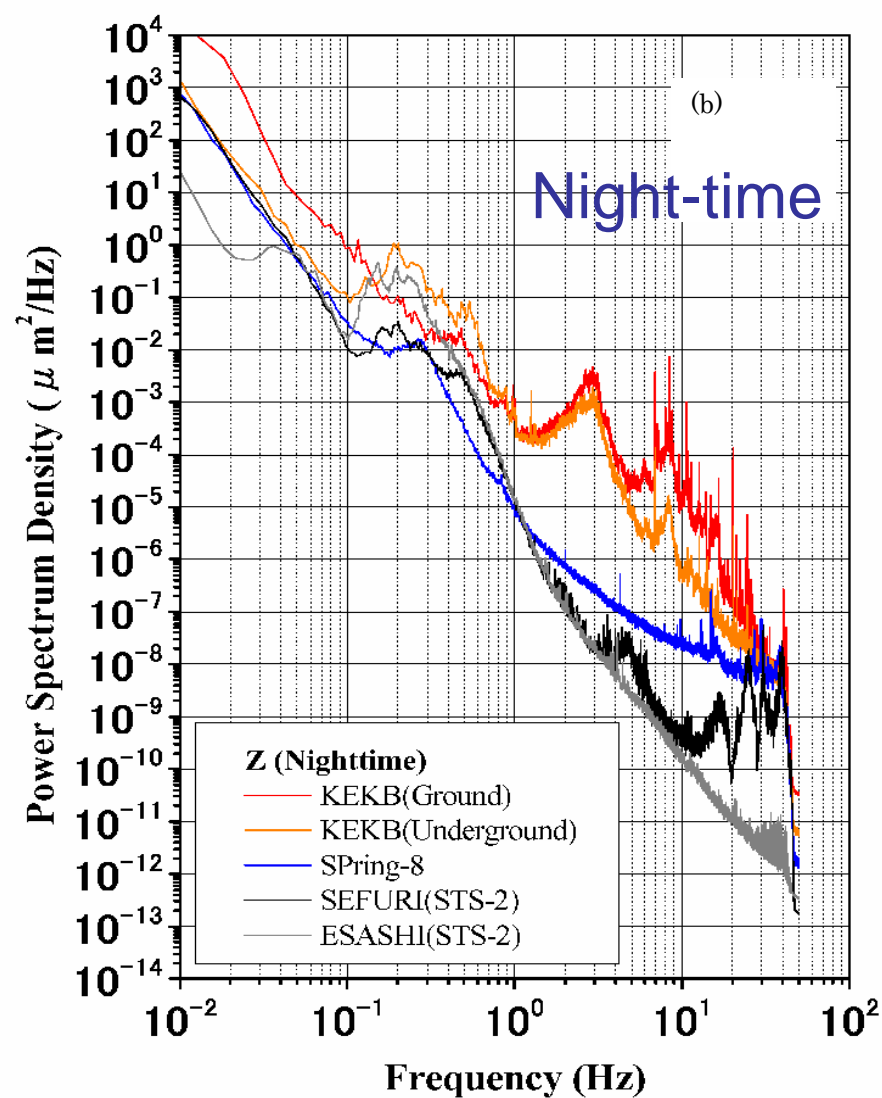
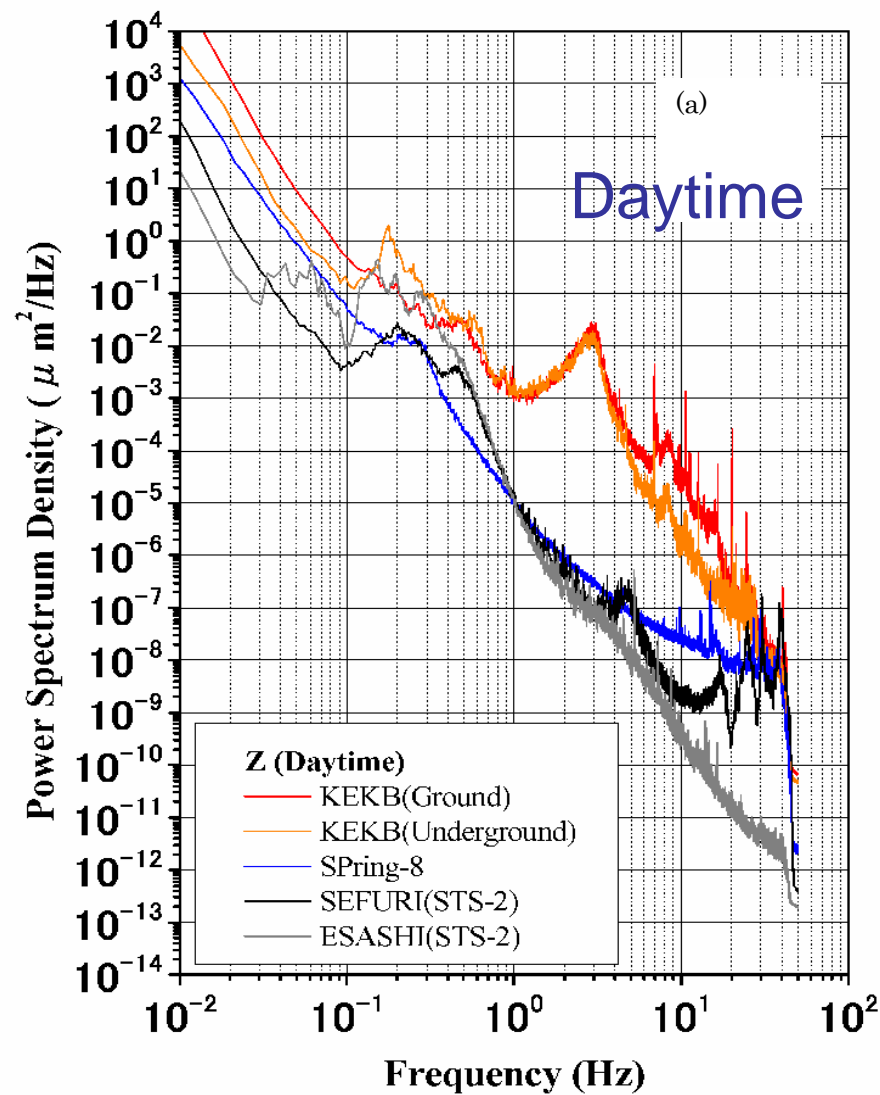


Fig.1 PSD (Power Spectrum Density)

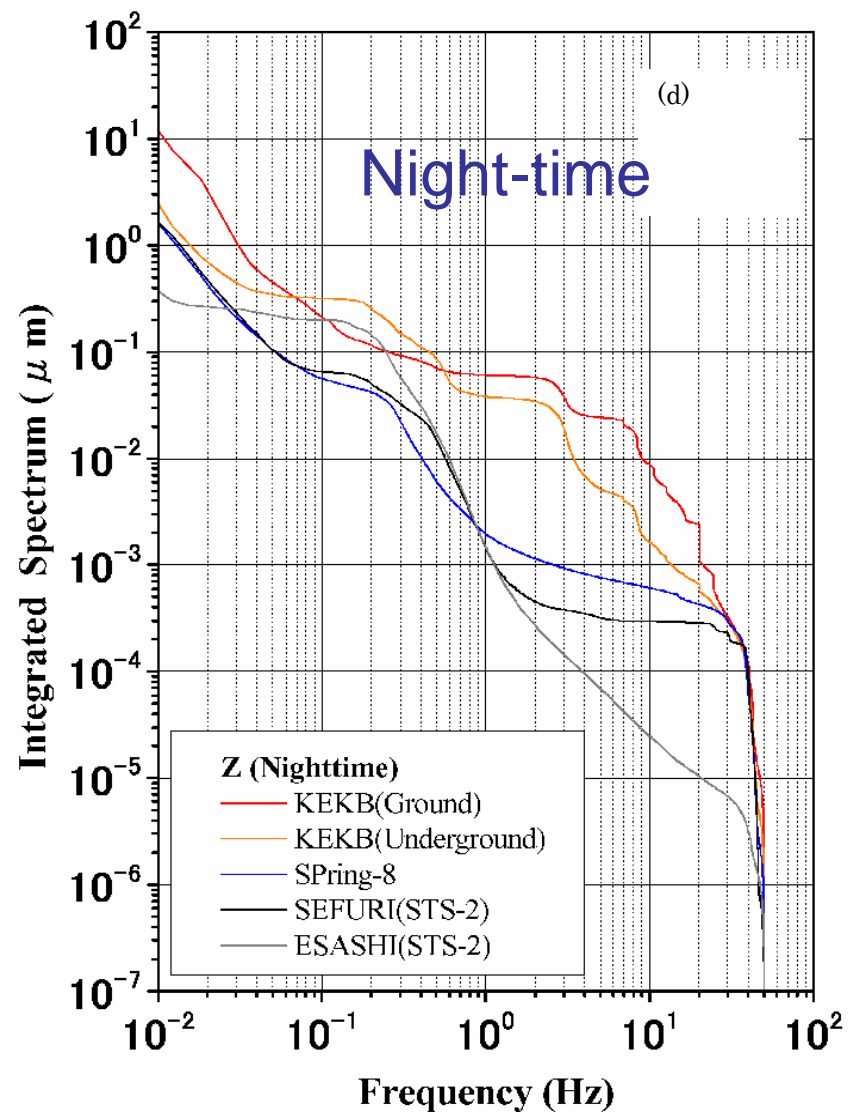
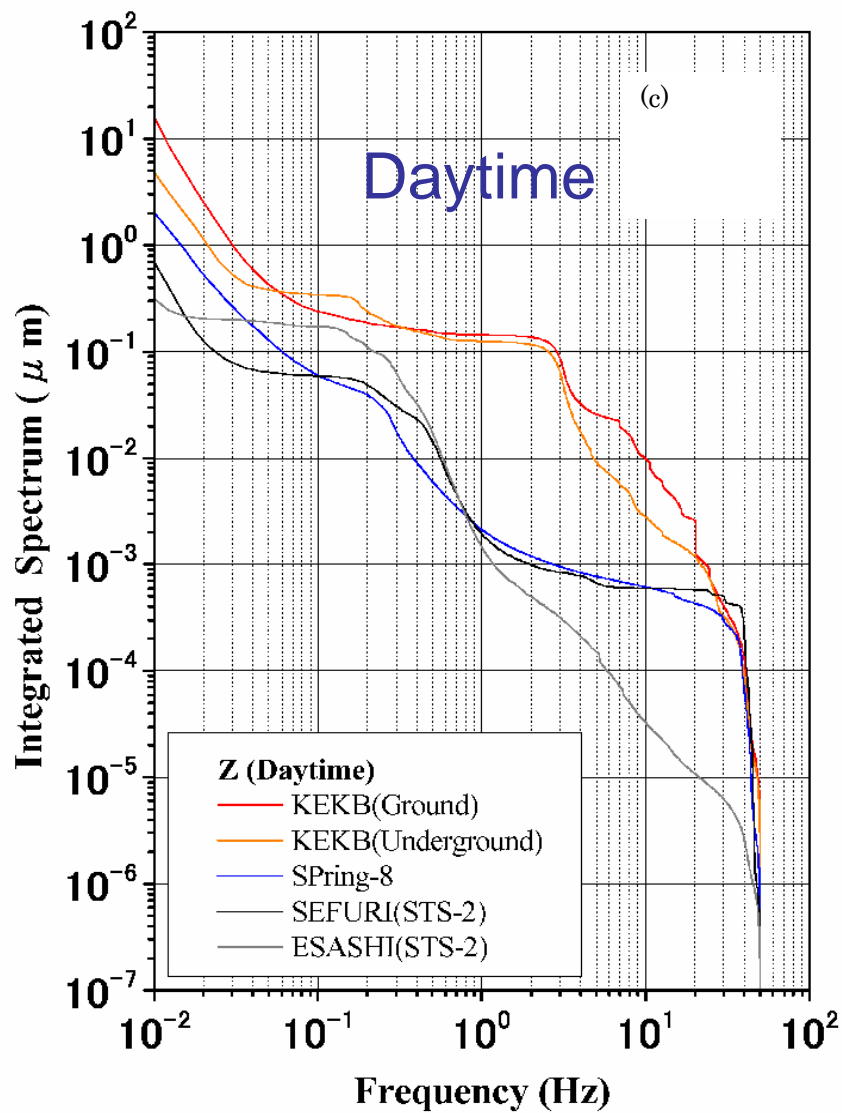


Fig.2 Integrated PSD

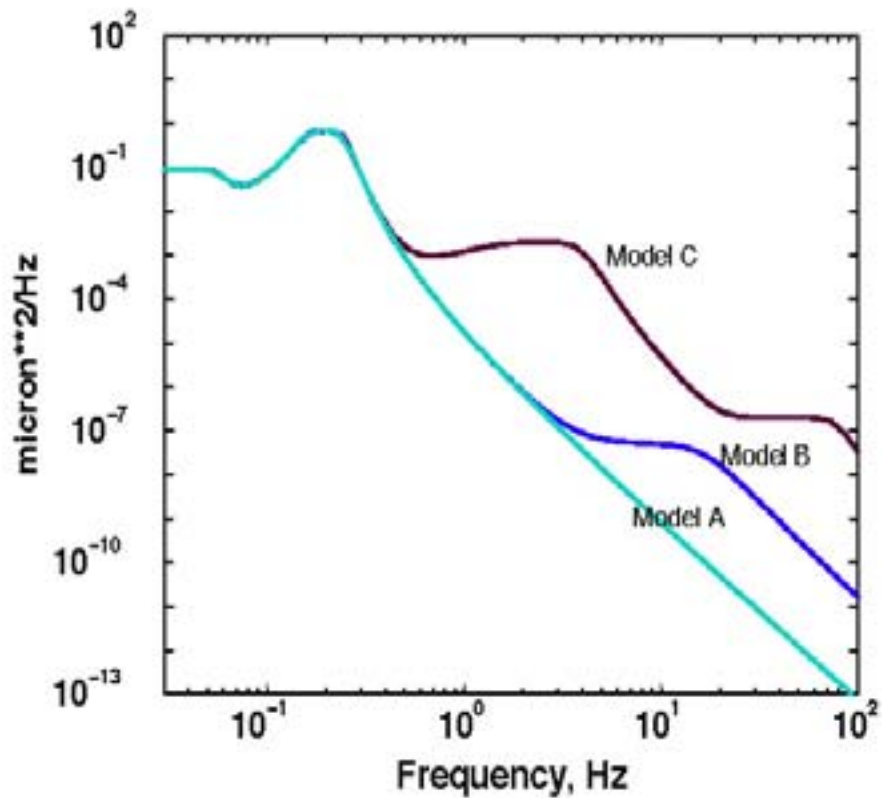


Mitsuse Road Tunnel

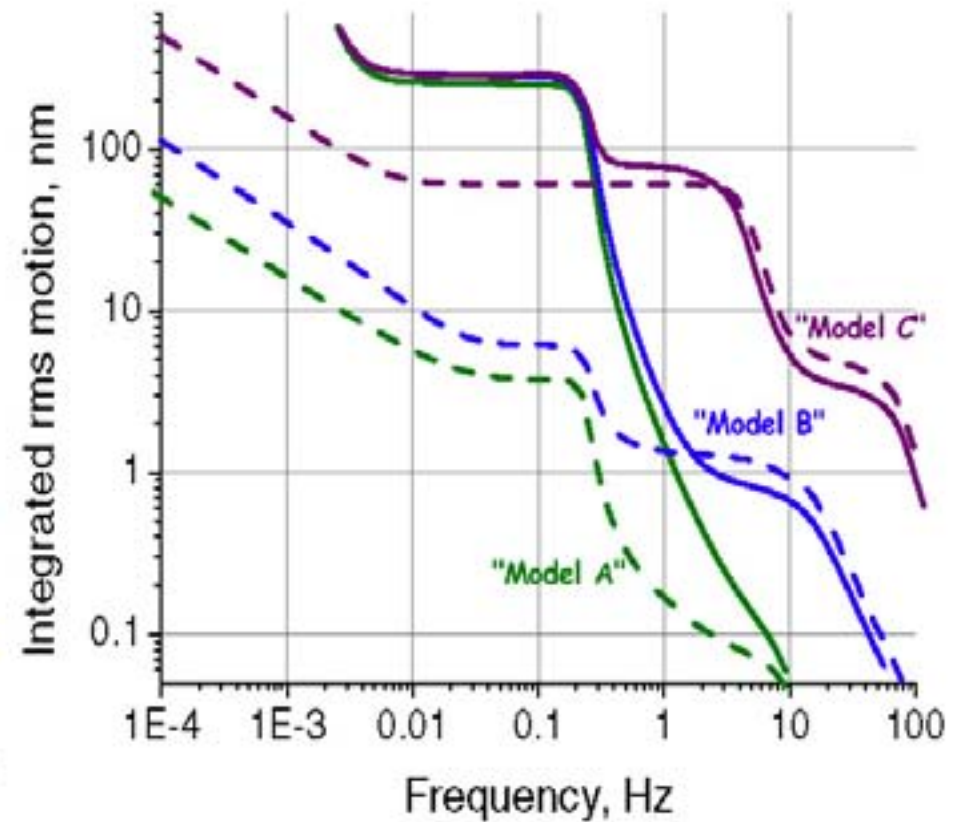
- Road tunnel penetrates granite rock area.
- Shelter is 800m far from the entrance.
- Traffic is about 360/H at daytime and 70/H at night-time.

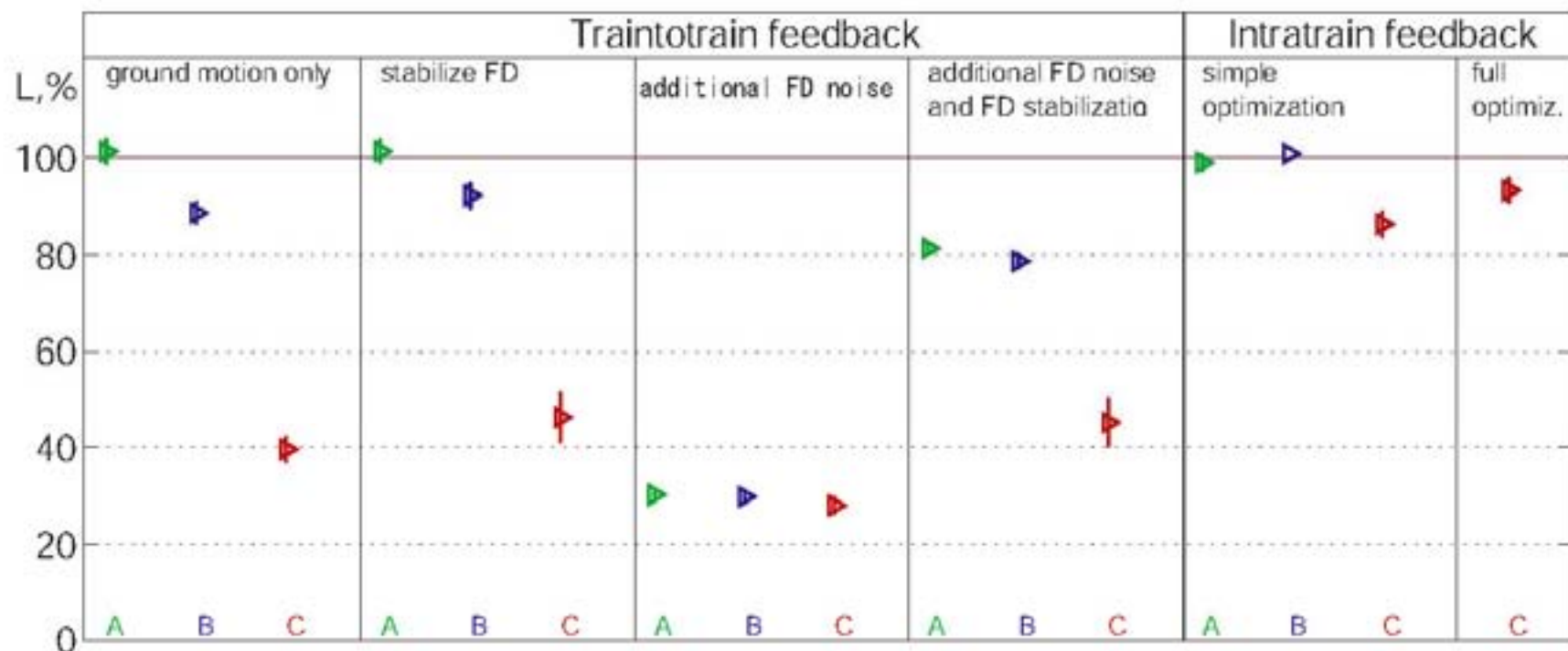
From TESLA TDR

PSD



Integrated PSD





Percentage of luminosity obtained with ground motion models A, B, C, with and without additional vibration of FD, and with different combinations of IP feedbacks and FD stabilization. With the intrain feedback, neither FD noise nor stabilization was included. The results are averaged over 50(?) trains. The error represents the statistical variation in mean luminosity.