Strong Ground Motions (NIED K-NET, KiK-net, MeSO-net)

IISEE, Building Research Institute

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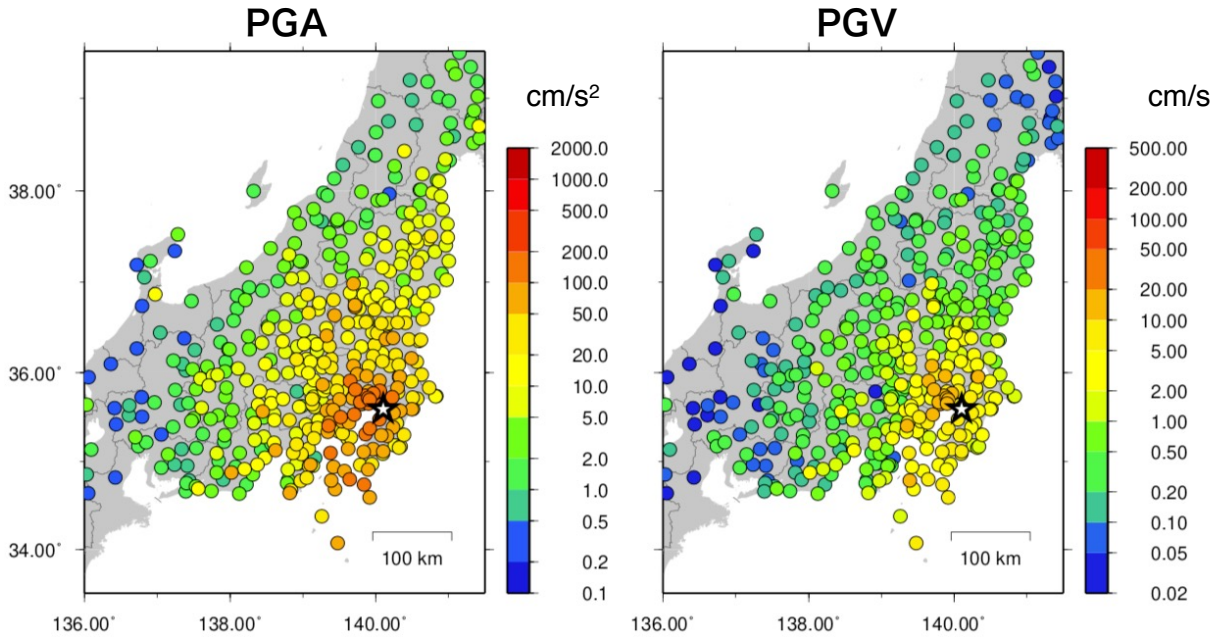
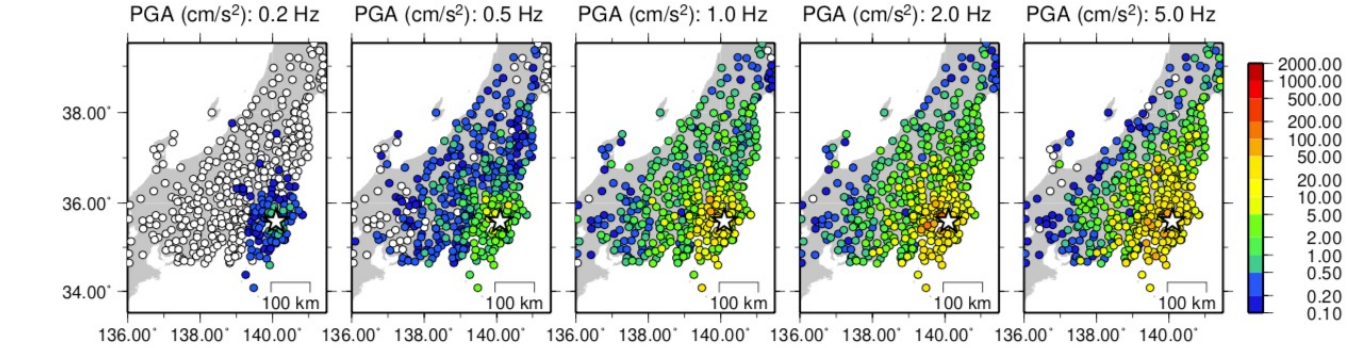
NIED Strong-motion data (K-NET, KiK-net)

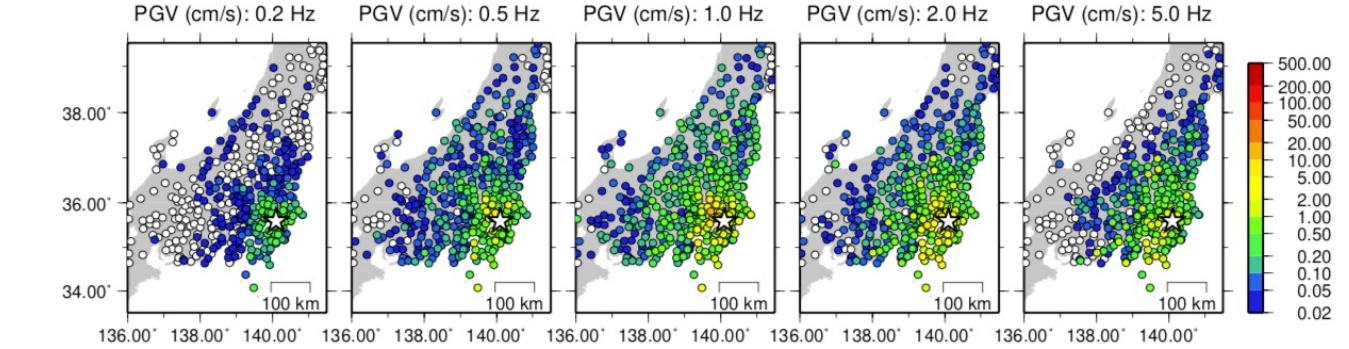


Larger PGAs (>100 cm/s^2) and PGVs (> 10 m/s) were recorded at many stations in the west of the epicenter.

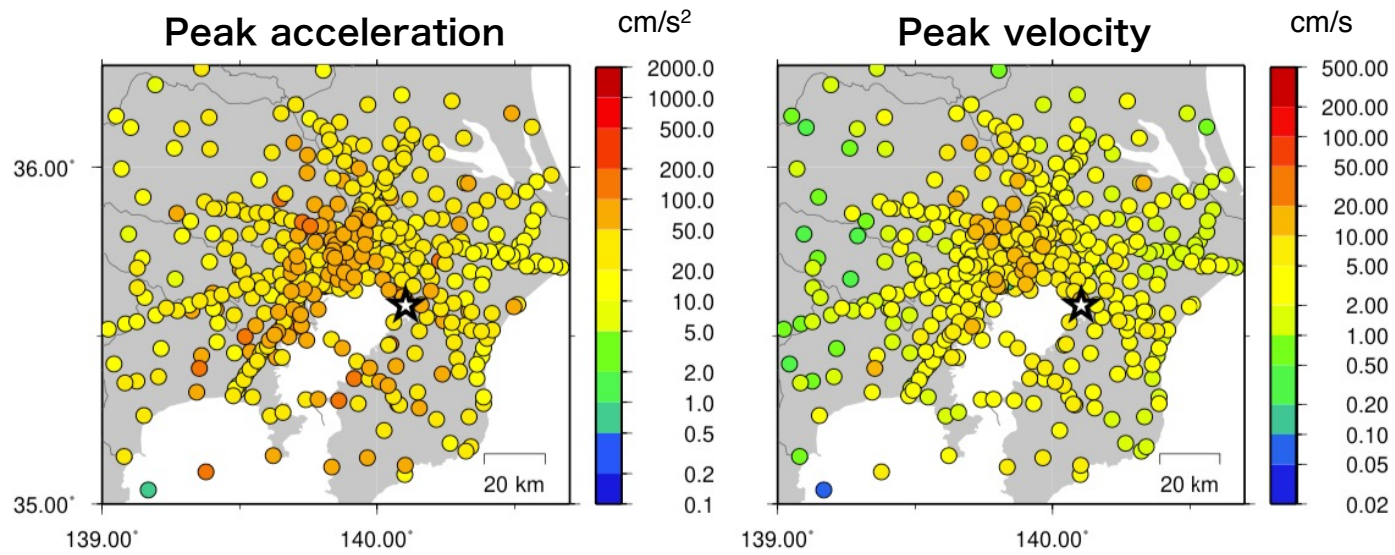
PGAs at different frequencies



PGVs at different frequencies



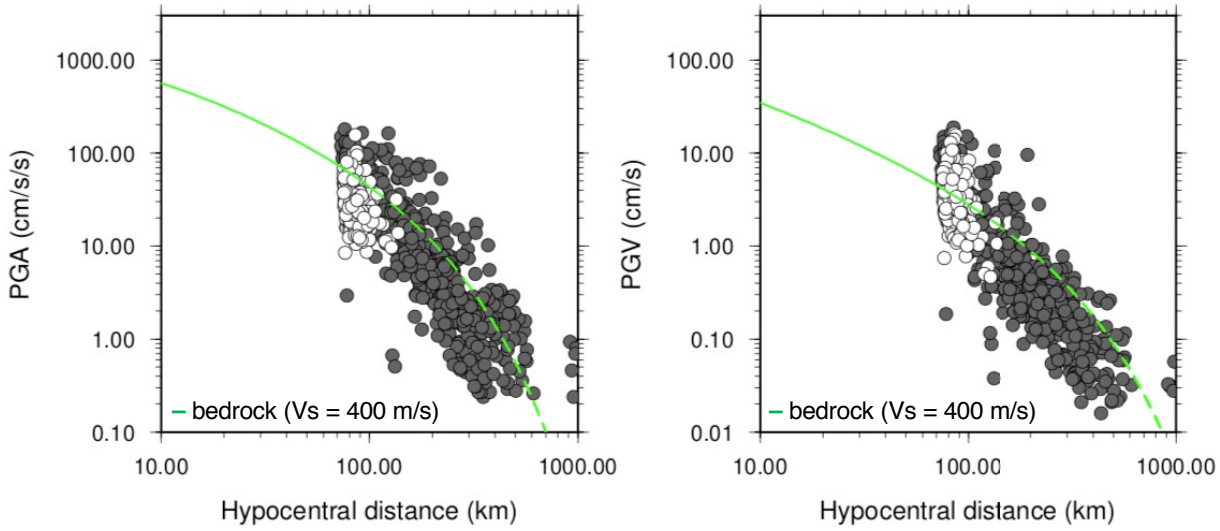
NIED data (with MeSO-net)



- Larger PGAs and PGVs were recorded at many stations in the west of the epicenter.
- Within the 23 wards of Tokyo, PGAs larger that 50 cm/s2) were recorded in the northeastern and southeastern parts (JMA intensity > 5-lower were recorded only in Adachi and Ota wards).

※ MeSO-net sensors are installed at about 20 m depth.

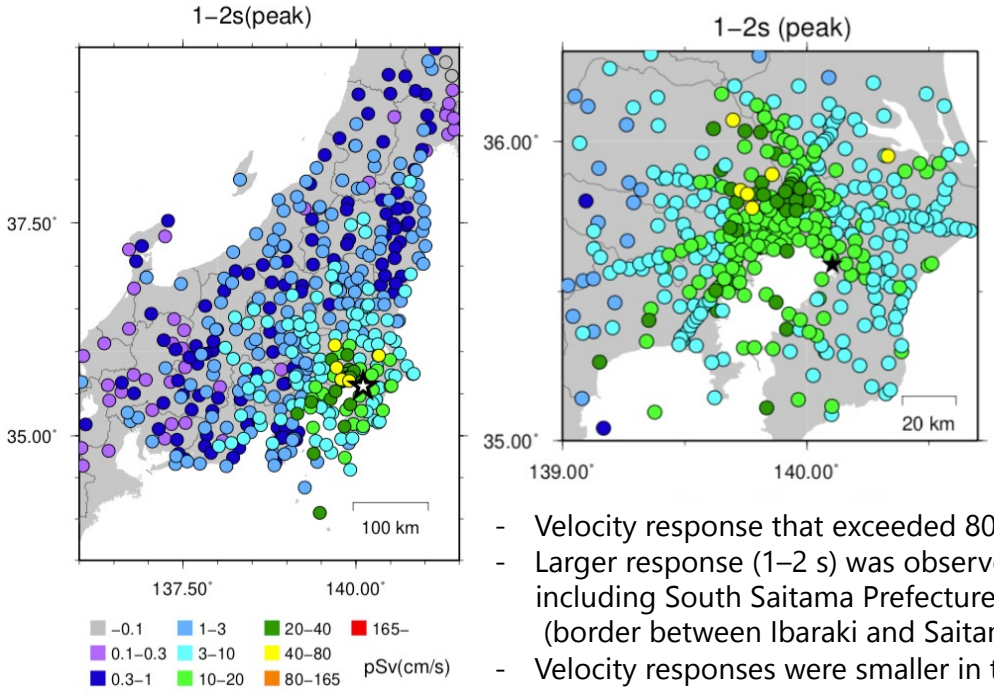
Observed PGAs/PGVs vs GMPE (Si and Midorikawa, 1999)



→ Agreements are generally good, although observed PGAs and PGVs show large variations.

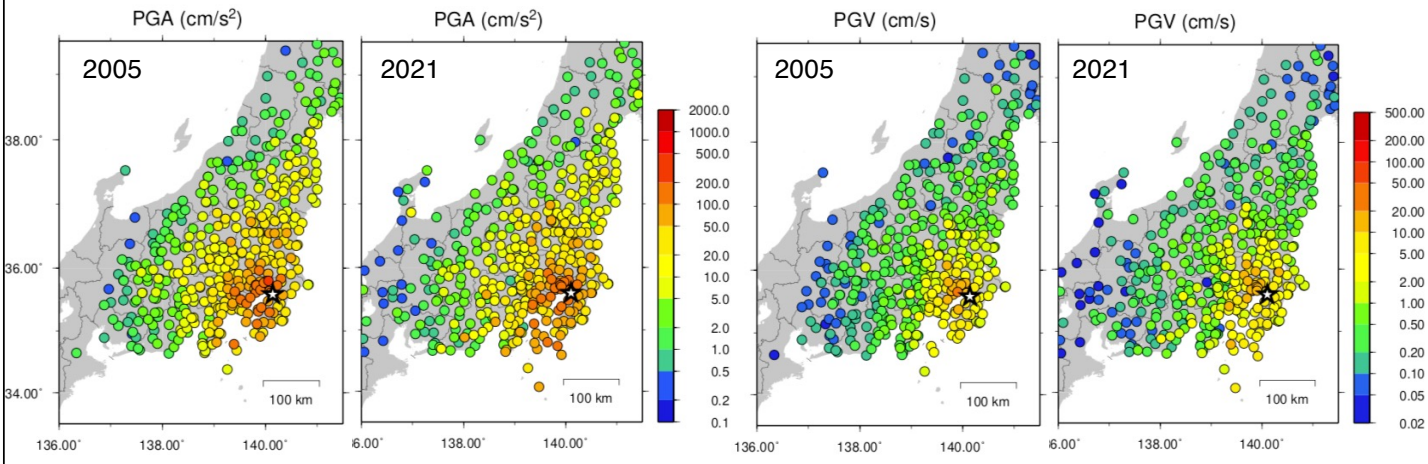
※ Hypocentral distance is shown in the horizontal axis (not "shortest distance to the fault").
※ Intraplate earthquake is assumed for the estimation.
※ Estimated values beyond 100 km (dashed line) are shown as reference values.

Pseudo-velocity Response Spectra (pSv; 1-2 s)



- Velocity response that exceeded 80 cm/s were not observed.
- Larger response (1–2 s) was observed in the NW of the epicenter, including South Saitama Prefecture and near Tonegawa River (border between Ibaraki and Saitama prefectures)
- Velocity responses were smaller in the east of the epicenter.

Comparison with the earthquake on July 23, 2005



- Location, magnitude and mechanism are similar with the earthquake occurred on July 23, 2005 (Mw5.9, depth = 73 km) .
- Observed ground motions also show similar tendency.

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Summary

- Relatively larger ground motions were observed in the west of the epicenter (Saitama, Tokyo, and Kanagawa).
- Ground motion levels are relatively smaller within the 23 wards of Tokyo (except stations near prefectural borders in Adachi and Ota wards) in comparison with neighboring prefectures.
- Velocity response between 1–2 s that exceeded 80 cm/s were not observed.
- Observed ground motions show similar trend with those recorded during the earthquake on July 23, 2005 (Mw5.9, depth=73 km).

Acknowledgements:

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https://www.doi.org/10.17598/NIED.0023

Velocity response spectra were calculated using the subroutine program developed by Osaki (1994).
Figures were prepared by using the Generic Mapping Tools (GMT: Wessel and Smith, 1998).