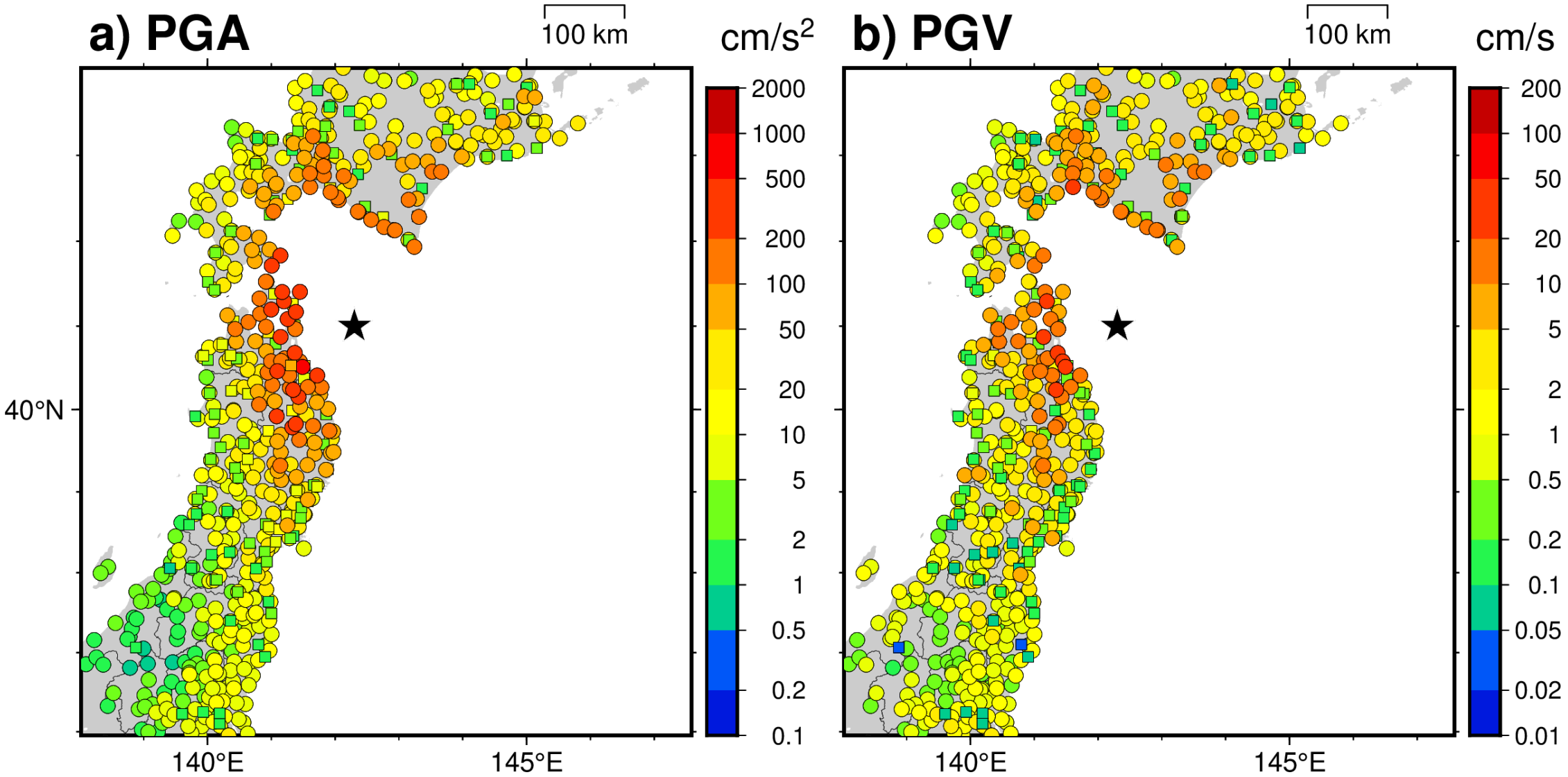
Strong Ground Motions

Earthquake in Aomori Pref. on December 8, 2025 (Mw7.4, Mj7.5)

IISEE, Building Research Institute

This report contains preliminary analysis results.

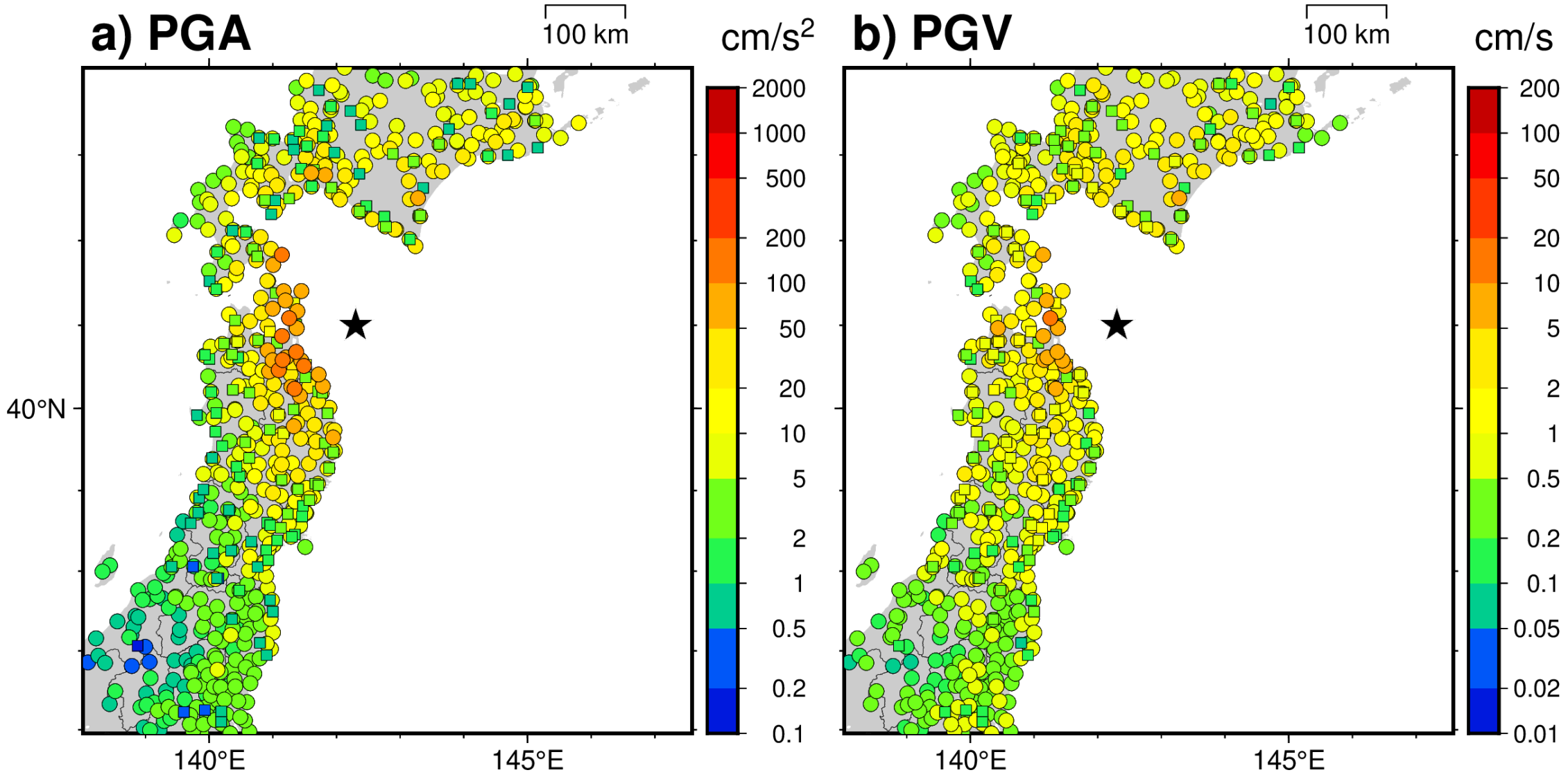
Observed PGAs/PGVs (Horizontal comp.)



○: NIED stations, □: JMA seismic intensity stations

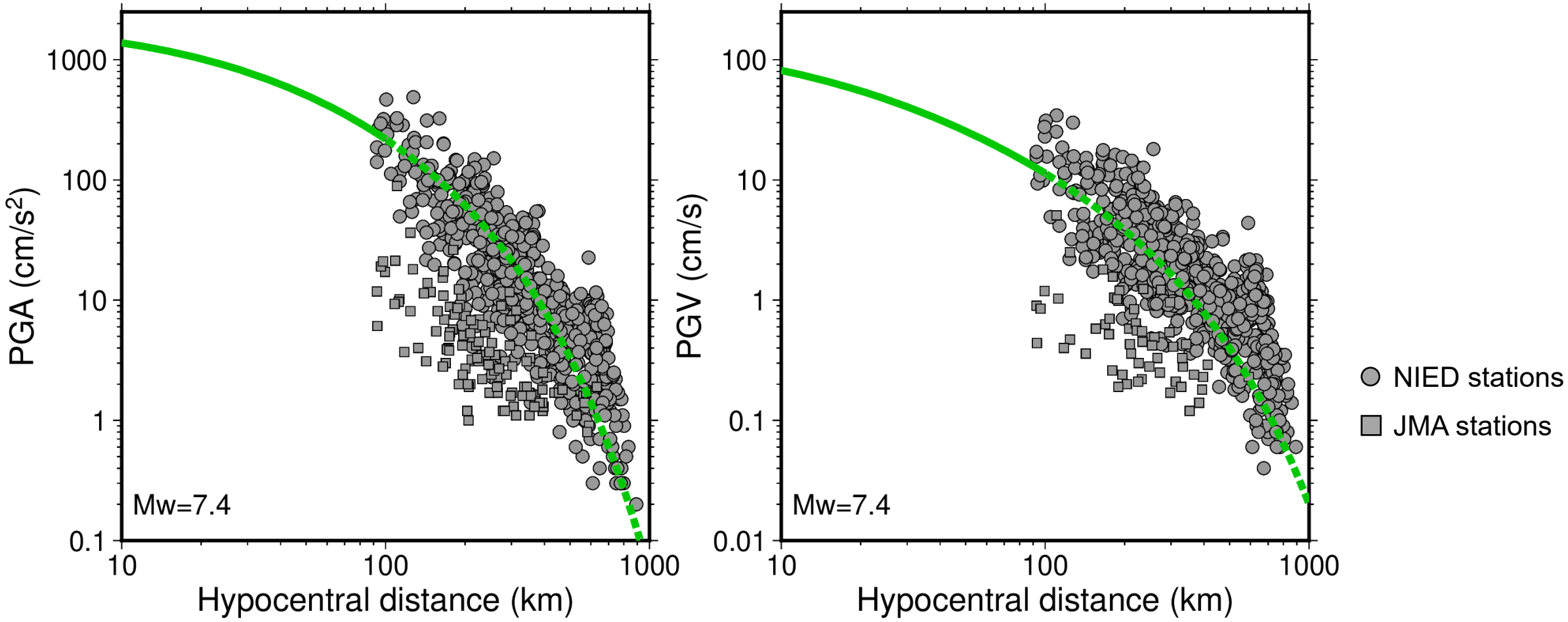
※ PGA and PGV are the maximum values of vector summation in the horizontal components.

Observed PGAs/PGVs (Vertical comp.)



○: NIED stations, □: JMA seismic intensity stations

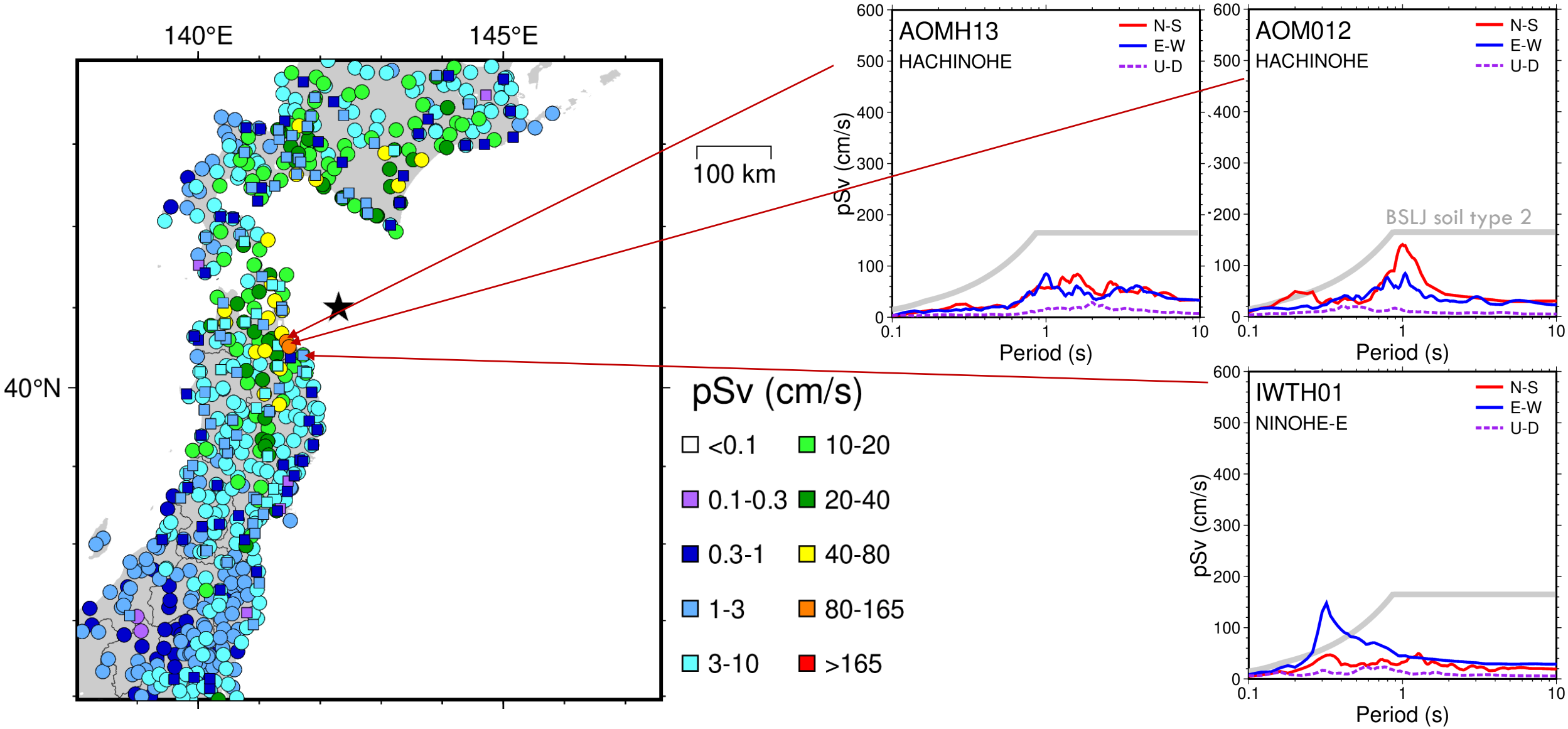
Observed PGAs/PGVs vs GMPE (Si & Midorikawa, 1999)



※ Horizontal axis is NOT the “shortest distance to the fault”.
※ PGA/PGV values are the larger of the maximum values of NS and EW components.
※ Crustal earthquake (depth=9.1 km) is assumed for the estimation.
※ Estimated values beyond 100 km (dashed line) are shown as reference values.

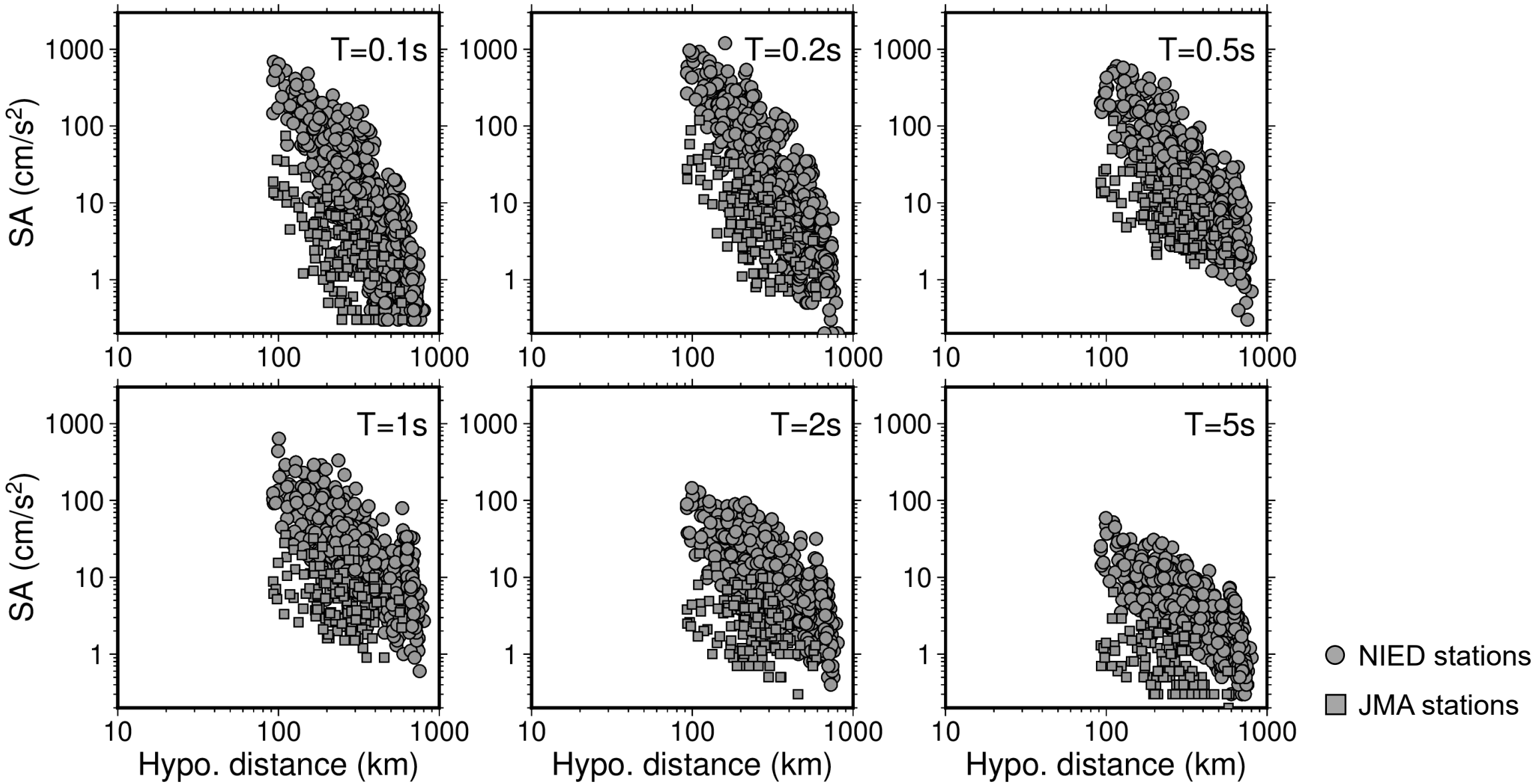
Pseudo-velocity response

(pSv: maximum value for periods of 1–2 s, 5% damping)

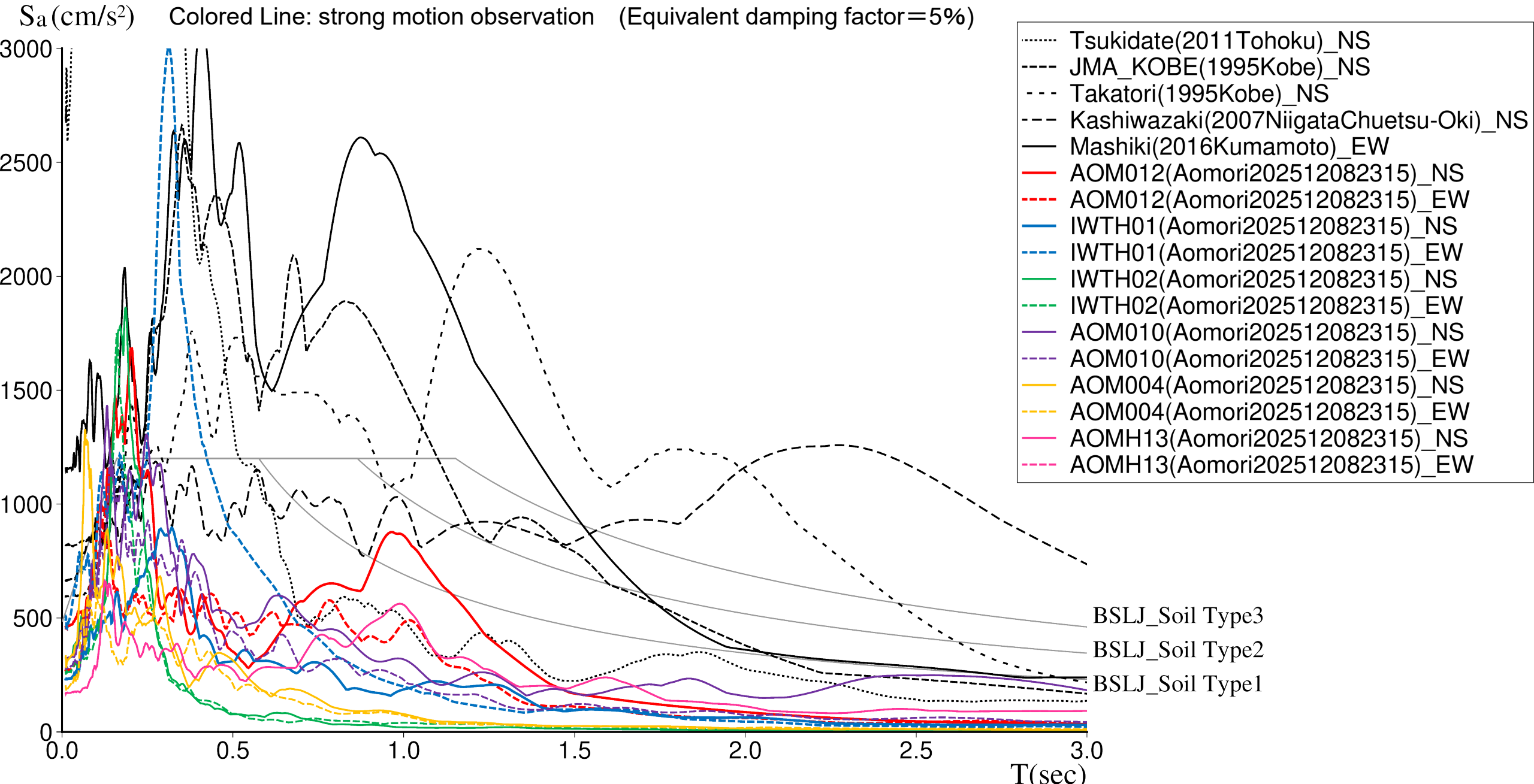


Attenuation characteristics of response spectra (Sa)

5% damping



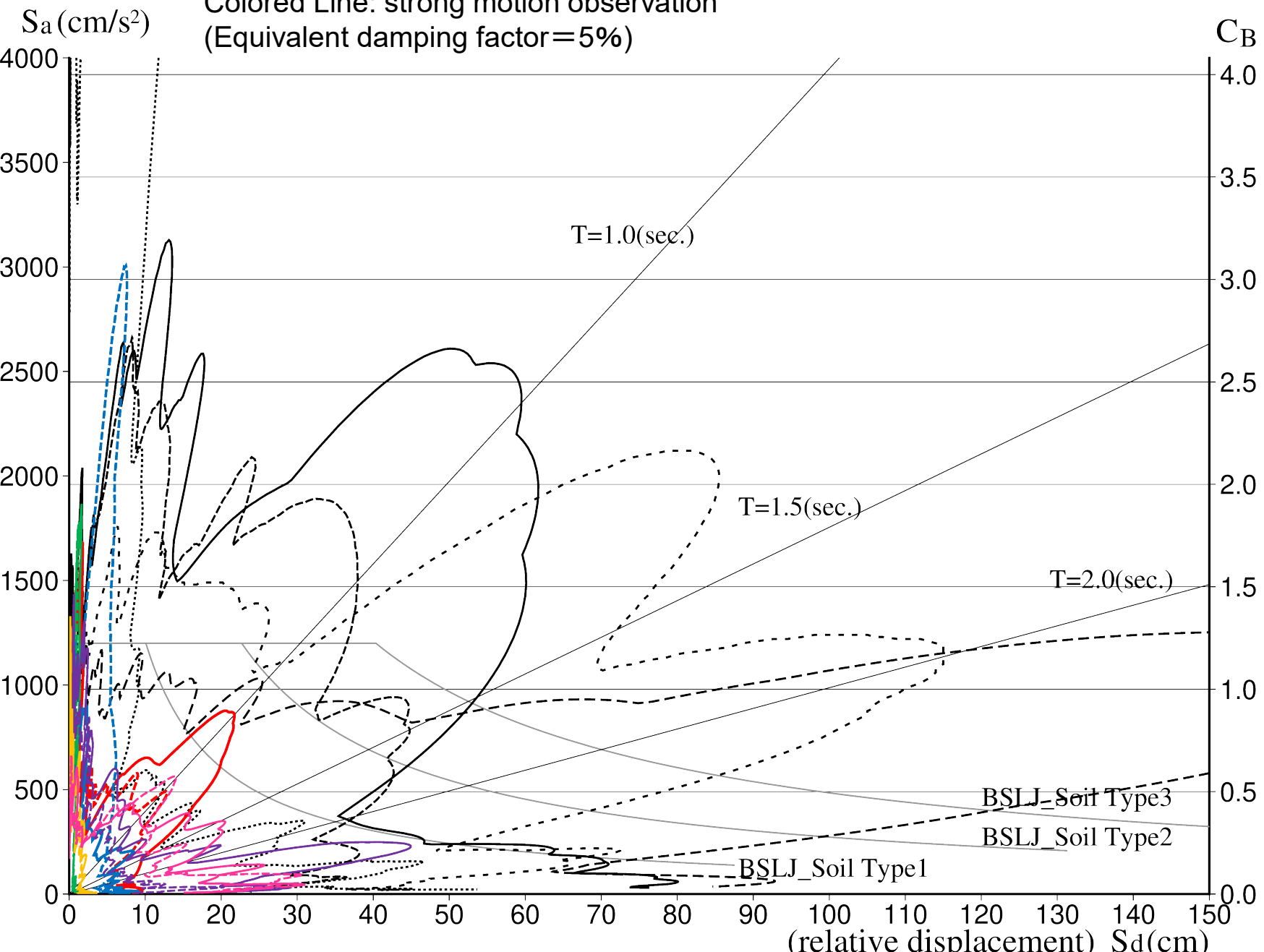
Response acceleration spectrum S_a and response periods

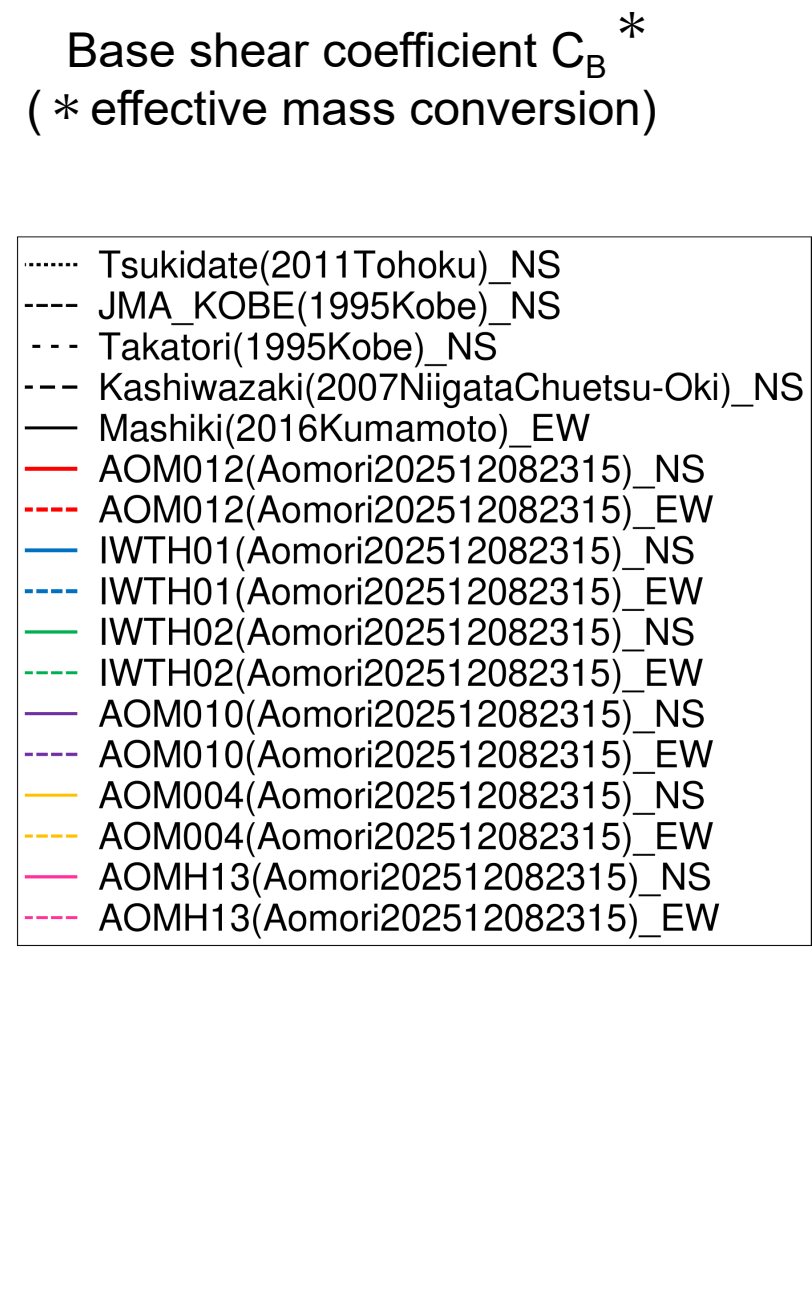


S_a - S_d curve and response periods

BRI

Colored Line: strong motion observation
(Equivalent damping factor＝5%)





Summary

- KiK-net station AOM012 (Hachinohe) and AOMH1 (Hachinohe) show 80<pSv <165 cm/s (5% damping, period of 1–2 s).
- Response of pSv >165 cm/s (5% damping, period of 1–2 s) was not observed.
- The response acceleration (Sa) of the East-West (EW) components of IWTH01 (Ninohe Higashi) showed large values in the period of 0.5 s or less.
- From the Sa-Sd curve assuming a 5% equivalent damping ratio, the Sa-Sd shapes of the North-South (NS) components of AOM012 (Hachinohe) were protruded with a period of one second.
- From the Sa-Sd curve, assuming a 5% equivalent damping ratio, the Sa-Sd shapes of this earthquake were smaller than those of past major earthquakes in Japan.

Acknowledgments

We utilized K-NET and KiK-net strong-motion data, provided by the National Research Institute for Earth Science and Disaster Resilience (NIED)
(https://www.doi.org/10.17598/NIED.0004), as well as strong-motion data from the Japan Meteorological Agency (JMA) seismic intensity stations.
We also used past records from the Railway Technical Research Institute (RTRI).
We used hypocenter information (location, moment magnitude) determined by NIED.
Response spectra were calculated using the subroutine program developed by Ohsaki (1994).
Figures were prepared using Generic Mapping Tools (GMT: Wessel et al, 2019).
Sa-T and Sa-Sd were calculated using the View Wave by Kashima, BRI.