Crustal Stress Map Data in Chugoku Region, western Japan

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1. Introduction

Geological Survey of Japan, AIST is constructing a crustal stress map in Japanese islands with high spatial resolution based on focal mechanism solution of microearthquakes (Imanishi, 2014). This open-file report includes 10km-mesh map of the crustal stress in the Chugoku region (Fig. 1) and focal mechanism solutions (Fig .2) determined in Imanishi et al. (2021). For details of the data, please refer to Imanishi et al. (2021).

2. Data

2.1 10km-mesh map of the crustal stress (data/10km_mesh.dat)

The format of the data is as follows.

Lat	Lon	S_{Hmax}	var(S_{Hmax})	fptype	var(fptype)	N	R	G	B

Lat: Latitude of mesh

Lon: Longitude of mesh

S_{Hmax}: S_{Hmax} direction (°) (angle measured clockwise from the north)

var(S_{Hmax}): Variance of S_{Hmax} direction (degree)

fptype: The type of stress field based on Shearer et al. (2006). fptype ranges from -1 to 1.

var(fptype): Variance of fptype

N: The number of focal mechanisms included in the corresponding mesh

R: R (red) value of fptype color scale (RGB) (0－255)

G: G (green) value of fptype color scale (RGB) (0－255)

B: B (blue) value of fptype color scale (RGB) (0－255)

2.2 Focal mechanism (data/mec_imanishi_et_al_2021.dat)
The format of the data is as follows.

YY	MM	DD	HH	MIN	SS	Lat	Lon	Dep	Mw	STR1	DIP1	SLP1
STR2	DIP2	SLP2	Pa	Pp	Ba	Bp	Ta	Tp	TYPE	R	G	B	RE

YY: Year
MM: Month
DD: Day
HH: Hour
MIN: Minute
SS: Second
Lat: Latitude
Lon: Longitude
Dep: Depth (km)
Mw: Moment magnitude
STR1: Strike of nodal plane 1 (°)
DIP1: Dip angle of nodal plane 1 (°)
SLP1: Slip angle of nodal plane 1 (°)
STR2: Strike of nodal plane 2 (°)
DIP2: Dip angle of nodal plane 2 (°)
SLP2: Strike of nodal plane 2 (°)
Pa: Azimuth of P-axis (°)
Pp: Plunge of P-axis (°)
Ba: Azimuth of B-axis (°)
Bp: Plunge of B-axis (°)
Ta: Azimuth of T-axis (°)
Tp: Plunge of T-axis (°)
TYPE: Faulting type defined by Frohlich (1992) (R: reverse-faulting, S: strike-slip faulting, N: normal faulting, O: other)
R: R (red) value of color scale (RGB) of triangle diagram by Frohlich (1992) (0－255)
G: G (green) value of color scale (RGB) of triangle diagram by Frohlich (1992) (0－255)
B: B (bule) value of color scale (RGB) of triangle diagram by Frohlich (1992) (0－255)
RE: Analyzed region 1 (R1), region 2 (R2), region 3 (R3), and region 4 (R4) in Imanishi et al. (2021)

(Note) This data does not include the focal mechanism solutions of the Japan Meteorological Agency earthquake catalog, which were used in constructing the 10km-mesh map of the crustal stress. If you need these data, please contact the first author (imani@ni.aist.go.jp).

3. Disclaimer

The Geological Survey of Japan, AIST shall not be responsible or liable for any damages that may arise from the use of stress map data on this website.

4. Citation

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References

Frohlich, C. (1992) Triangle diagrams: ternary graphs to display similarity and diversity of earthquake focal mechanism. *Phys. Earth Planet. Inter*, **75**, 193-198.

Imanishi, K. (2014) Introduction of Seismotectonics Research Group. *GSJ Chishitsu News*, 4, 100-101 (in Japanese).

Imanishi, K., Uchide, T., Shiina, T., Matsushita, R. and Nakai, M. (2021) Construction of Crustal Stress Map in Chugoku Region, western Japan. *Bulletin of the Geological Survey of Japan*, 72, 1, 23-40 (in Japanese with English abstract).

Shearer, P. M., Prieto, G. A. and Hauksson, E. (2006) Comprehensive analysis of earthquake source spectra in southern California. *J. Geophys. Res*., **111**, B06303, https://doi.org/10.1029/2005JB003979.

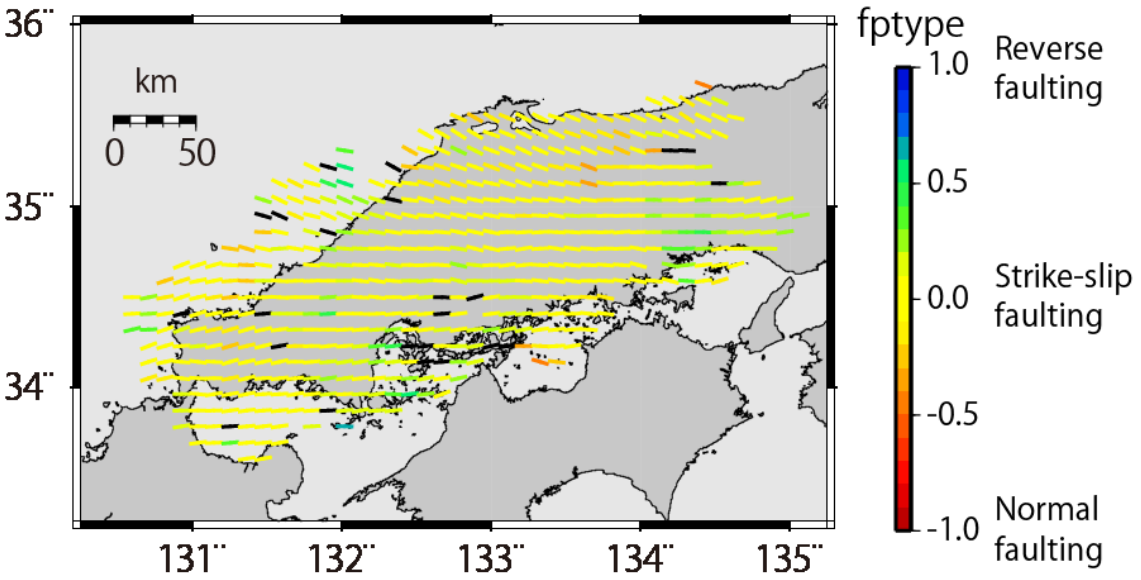

Fig.1 10-km mesh map of the crustal stress

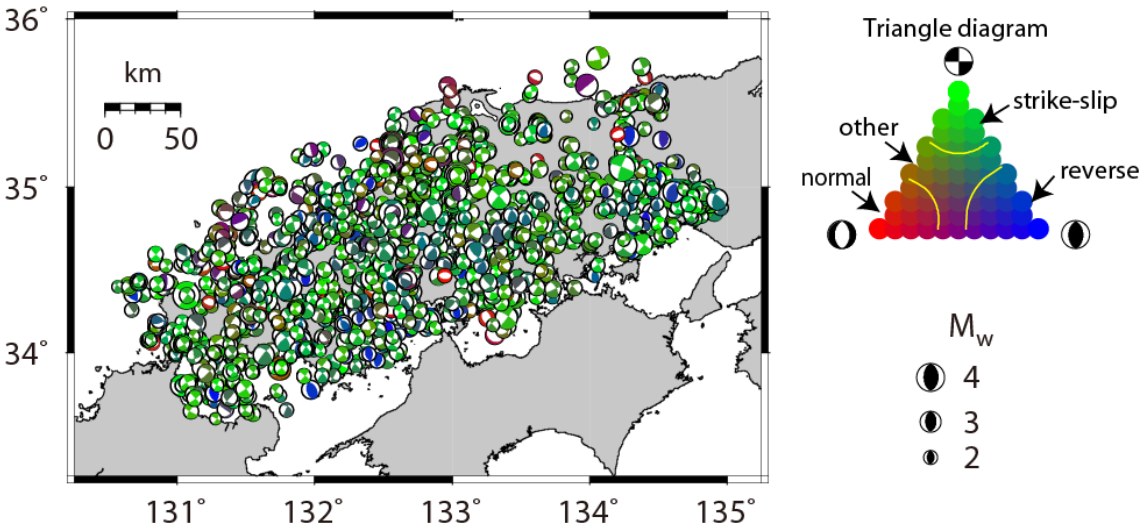

Fig.2 Focal mechanism solutions