

Irregular Rupture Process of the 2022 Taitung, Taiwan, Earthquake Sequence

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Table S1: Structure from CRUST1.0¹ used for calculating Green's functions

V_P (km/s)	V_S (km/s)	Density (10^3 kg/m ³)	Thickness (km)
5.80	3.40	2.63	14.47
6.30	3.62	2.74	12.86
6.90	3.94	2.92	12.85
7.75	4.32	3.20	- (Moho)

Table S2: An alternative structure from CRUST2.0¹ used for calculating Green's functions

V_P (km/s)	V_S (km/s)	Density (10^3 kg/m ³)	Thickness (km)
6.5	3.5	2.7	15.0
6.6	3.7	2.9	9.0
7.2	4.0	3.05	11.0
8.0	4.6	3.3	- (Moho)

Table S3: An alternative structure (semi-infinite model) used for calculating Green's functions

V_P (km/s)	V_S (km/s)	Density (10^3 kg/m ³)	Thickness (km)
5.80	3.40	2.63	-

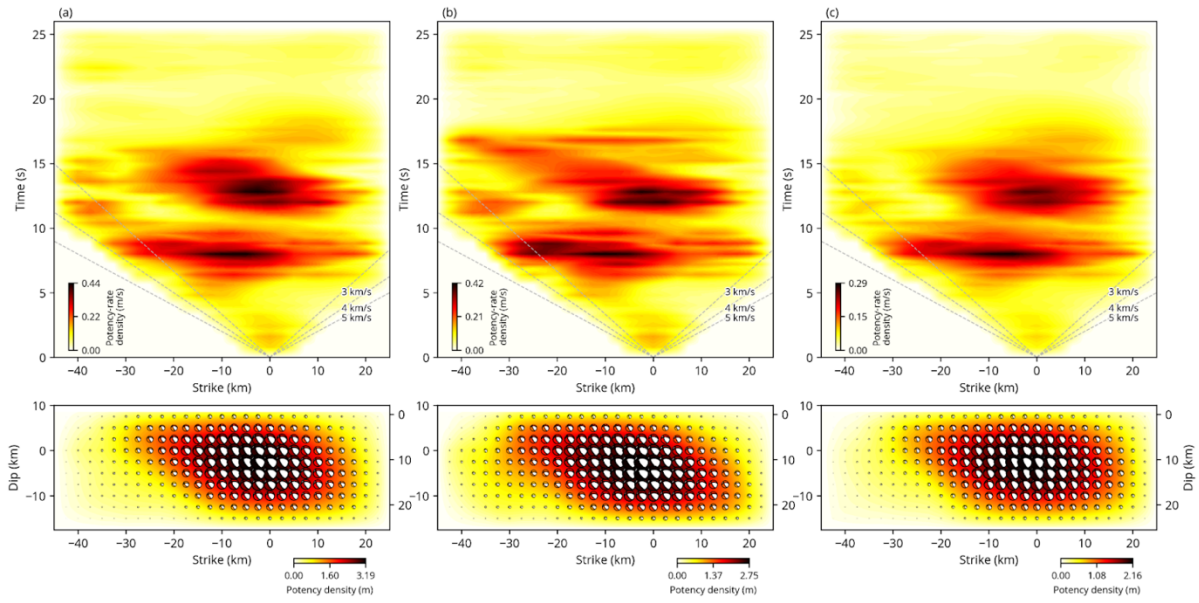


Figure S1: A comparison of potency-rate density evolution and total potency tensor distribution using (a) CRUST1.0 model (Table S1), (b) CRUST2.0 model (Table S2) and (c) a semi-infinite structure model (Table S3). The top panel of each case shows potency-rate density evolution projected along-strike distance from the mainshock epicenter. The bottom panel of each case shows total potency tensor distribution projected onto the mainshock model plane. The beachball is the moment tensor solution viewed from the east-northeast.

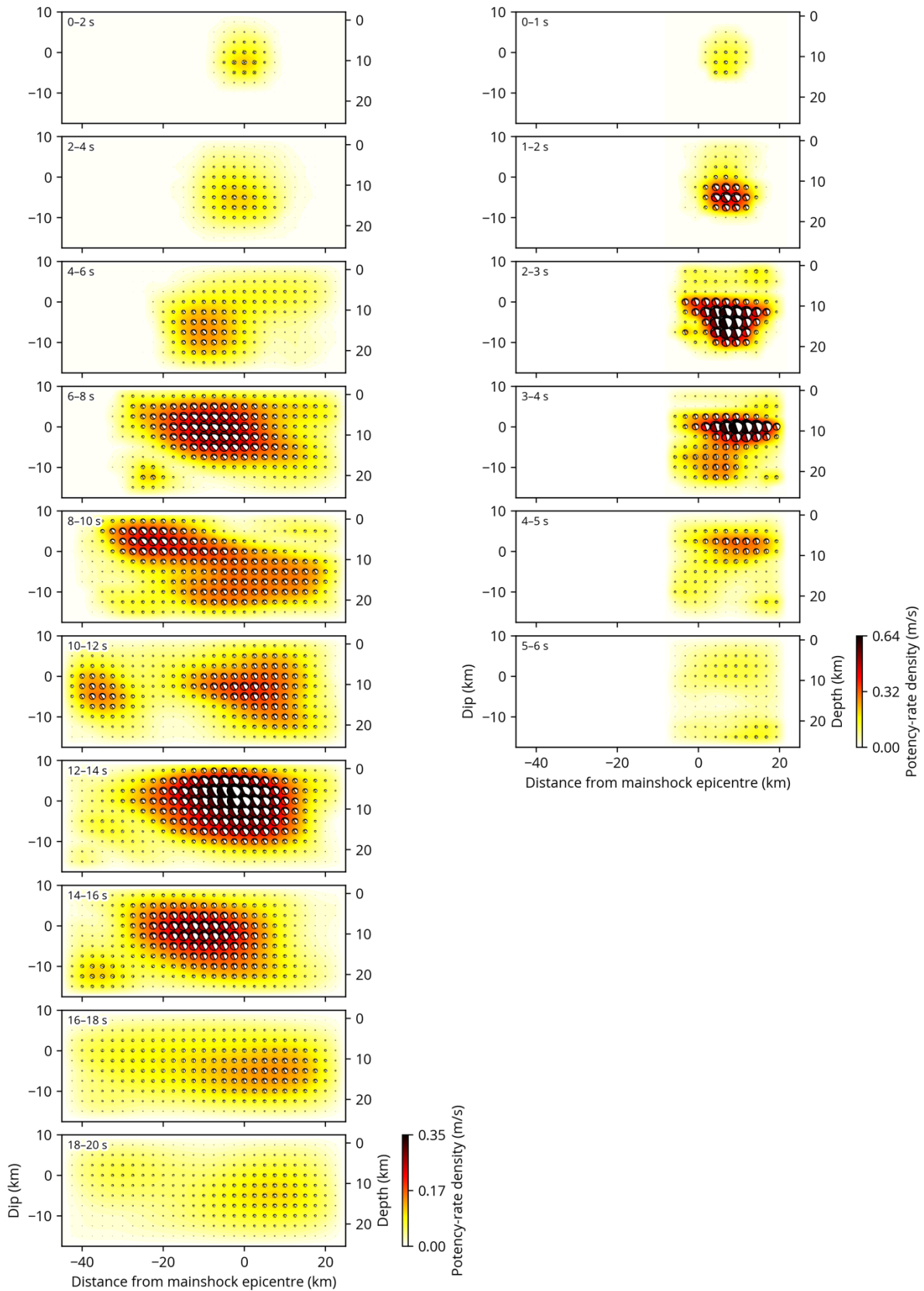


Figure S2: Snapshots of models for the mainshock (left panels) and largest foreshock (right panels). The distance (abscissa) is measured on the projected line along the strike direction of the mainshock model fault. The way of plotting beachballs is the same as that of Fig. S1.

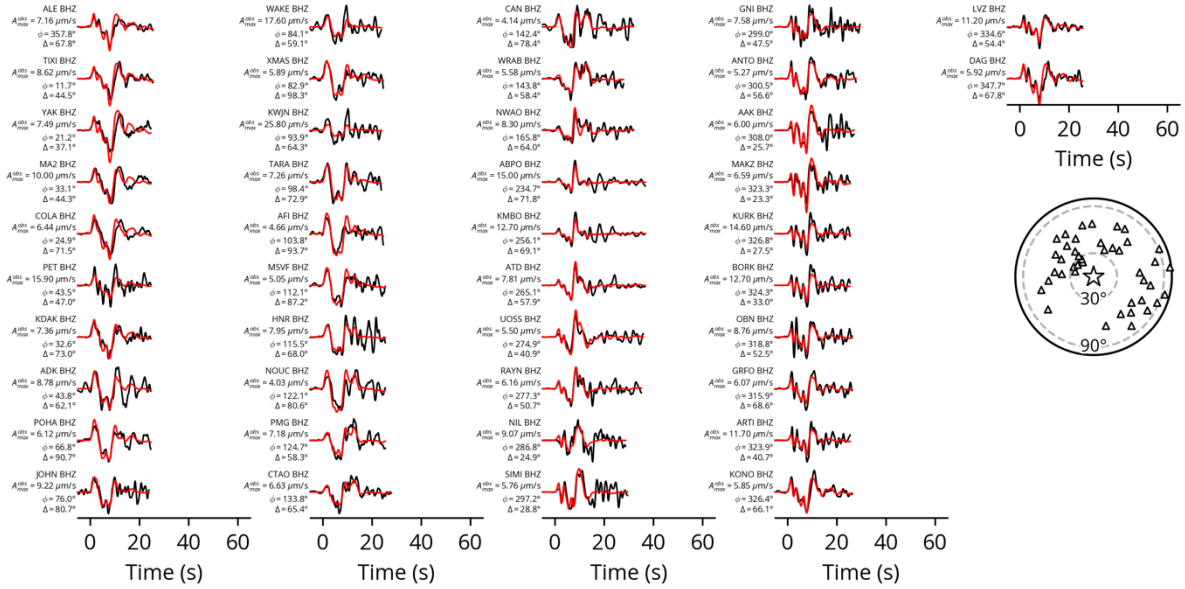


Figure S3: Waveform fits of the largest foreshock model. The black and red traces are the observed and synthetic waveforms, respectively. The station code, channel, maximum amplitude of the observed data, station azimuth (ϕ), and epicentral distance (Δ) are shown on left of each panel. The right-bottom panel shows the station distribution (triangle). The star denotes the epicentre. The dashed lines are the reference epicentral distances.

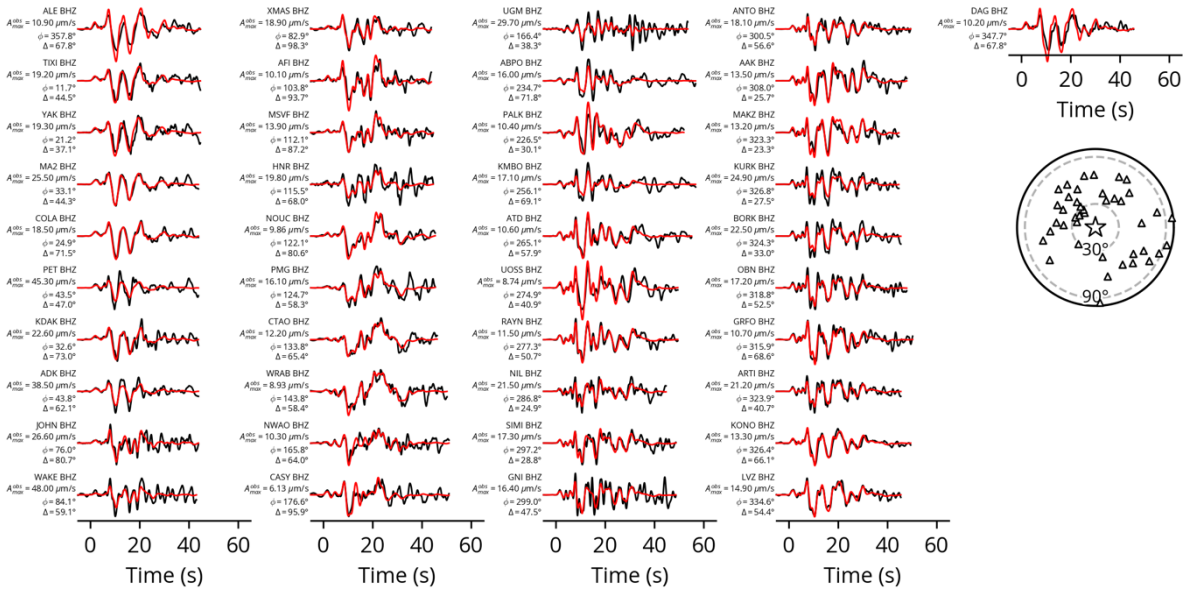


Figure S4: Waveform fits of our preferred mainshock model. The black and red traces are the observed and synthetic waveforms, respectively. The station code, channel, maximum amplitude of the observed data, station azimuth (ϕ), and epicentral distance (Δ) are shown on left of each panel. The right-bottom panel shows the station distribution (triangle). The star denotes the epicentre. The dashed lines are the reference epicentral distances.

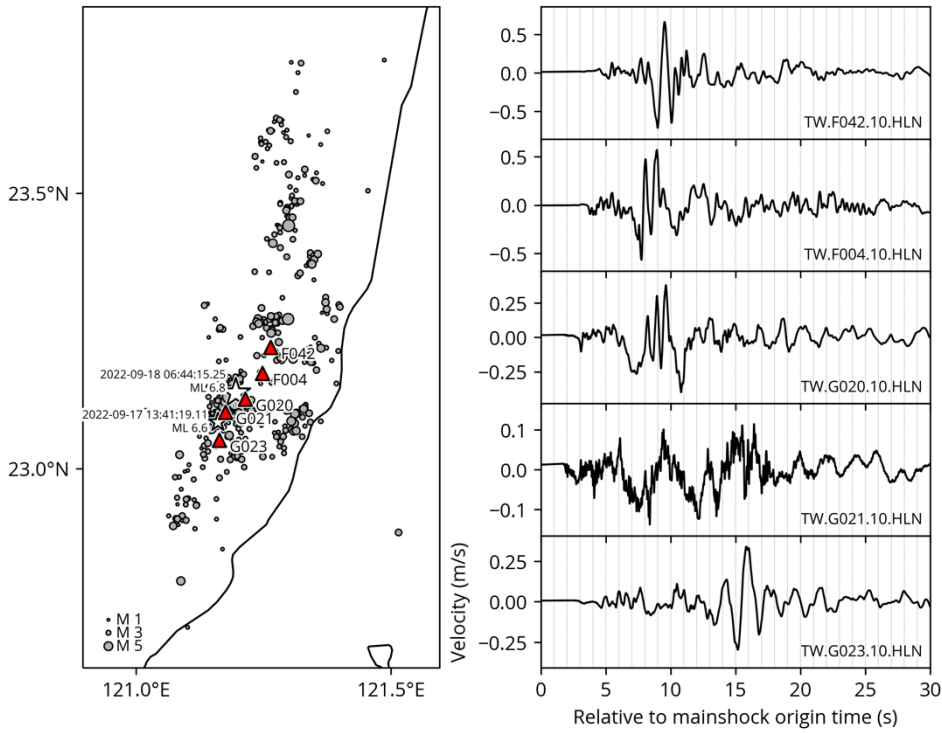


Figure S5: Example traces of near-field strong motion records of the mainshock from CWB Taiwan (2012)². The stars (foreshock and mainshock) and the dots (3-day aftershocks) are from CWB Taiwan (2012)². The location of each station is shown on a map (triangle). The black lines are the coastlines. The station network, code and channel are denoted on bottom-right of each trace panel.

References

1. Laske, G., Masters, T. G., Ma, Z., & Pasyanos, M. (2013). Update on CRUST1.0 - A 1-degree Global Model of Earth's Crust. *EGU Gen. Assem.* **15**, 2658 (2013)
2. Central Weather Bureau (CWB, Taiwan). (2012). Central Weather Bureau Seismographic Network [Data set]. International Federation of Digital Seismograph Networks. <https://doi.org/10.7914/SN/T5>