Additional file 1 for

Ocean-wave phenomenon around Japan Island due to the 2022 Tonga eruption observed by the wide and dense ocean-bottom pressure gauge networks

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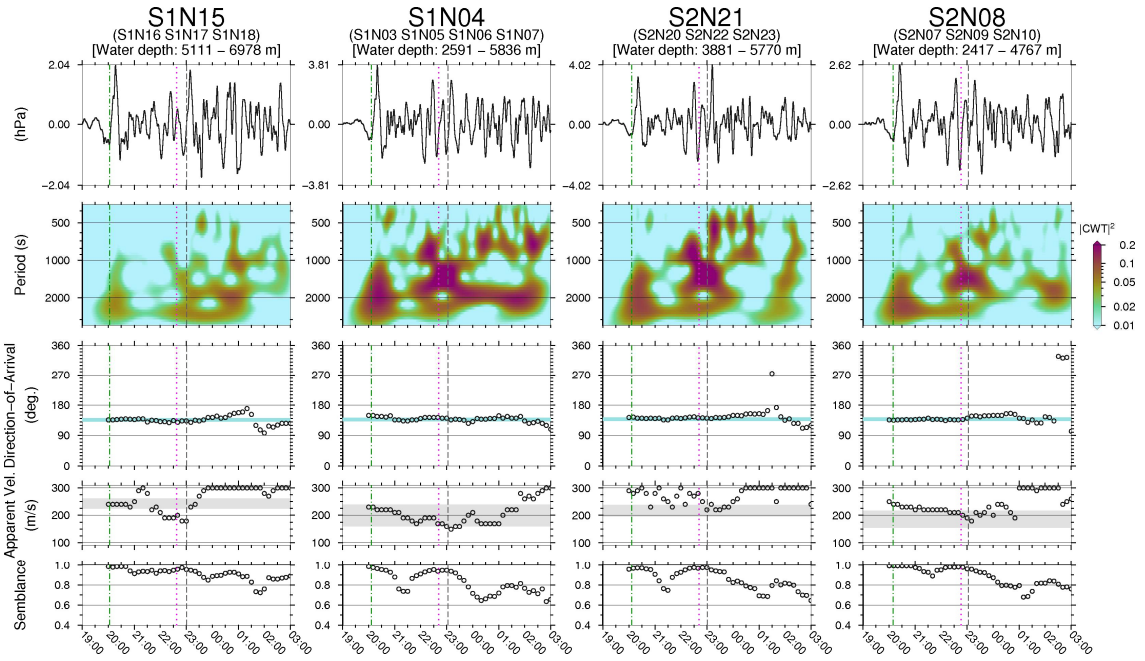
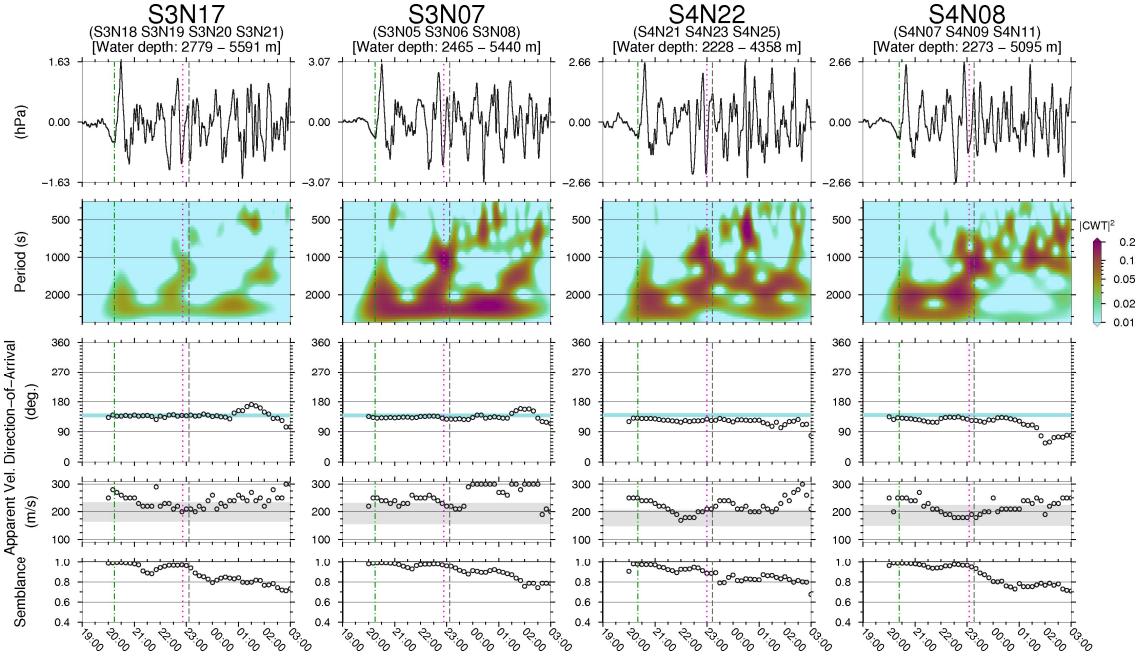
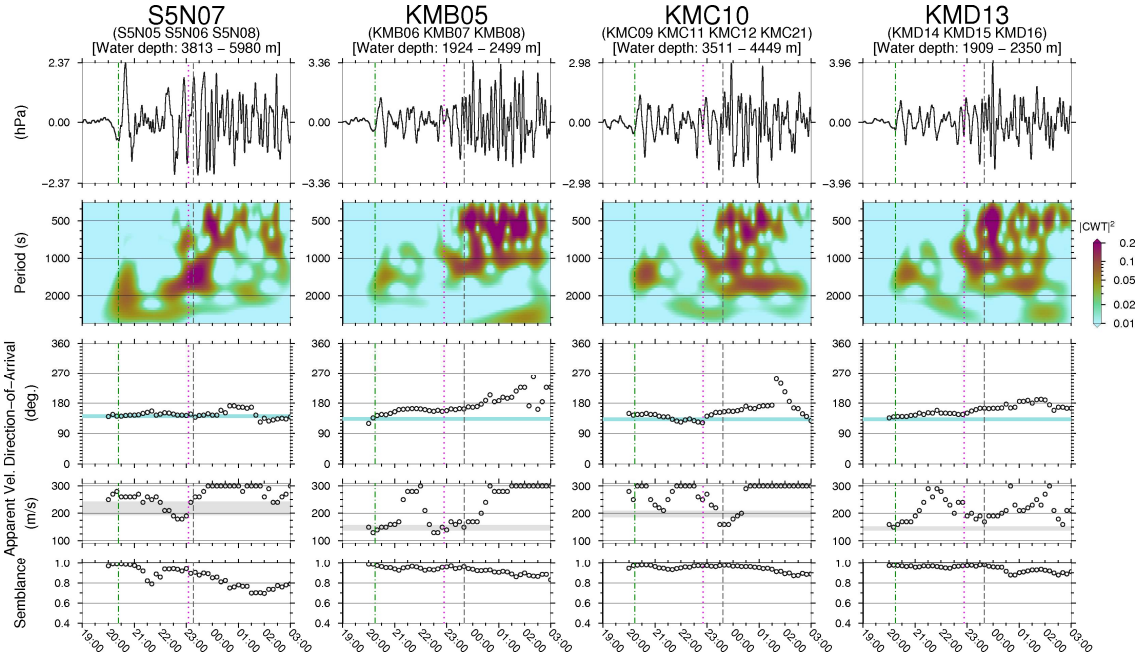
Ocean-bottom pressure waveforms and scalograms with the results of semblance analyses for 16 stations are shown in Fig. A1. The waveform trace of ocean-bottom pressure from near-trench S-net stations to near-coast S-net stations is shown in Fig. A2. The waveform trace of ocean-bottom pressure at S-net and DONET station and atmospheric pressure at V-net stations along the geodesic distance from the Hunga Tonga–Hunga Ha'apai volcano is shown in Fig. A3.


S1N15
(S1N16 S1N17 S1N18)
[Water depth: 5111 – 6978 m]
S1N04
(S1N03 S1N05 S1N06 S1N07)
[Water depth: 2591 – 5836 m]
S2N21
(S2N20 S2N22 S2N23)
[Water depth: 3881 – 5770 m]
S2N08
(S2N07 S2N09 S2N10)
[Water depth: 2417 – 4767 m]
(hPa)
Period (s)
|CWT|²
Apparent Vel. (m/s)
Direction–of–Arrival (deg.)
Semblance

15


S3N17
(S3N18 S3N19 S3N20 S3N21)
[Water depth: 2779 – 5591 m]
S3N07
(S3N05 S3N06 S3N08)
[Water depth: 2465 – 5440 m]
S4N22
(S4N21 S4N23 S4N25)
[Water depth: 2228 – 4358 m]
S4N08
(S4N07 S4N09 S4N11)
[Water depth: 2273 – 5095 m]
(hPa)
Period (s)
|CWT|²
Apparent Vel. (m/s)
Direction–of–Arrival (deg.)
Semblance

16



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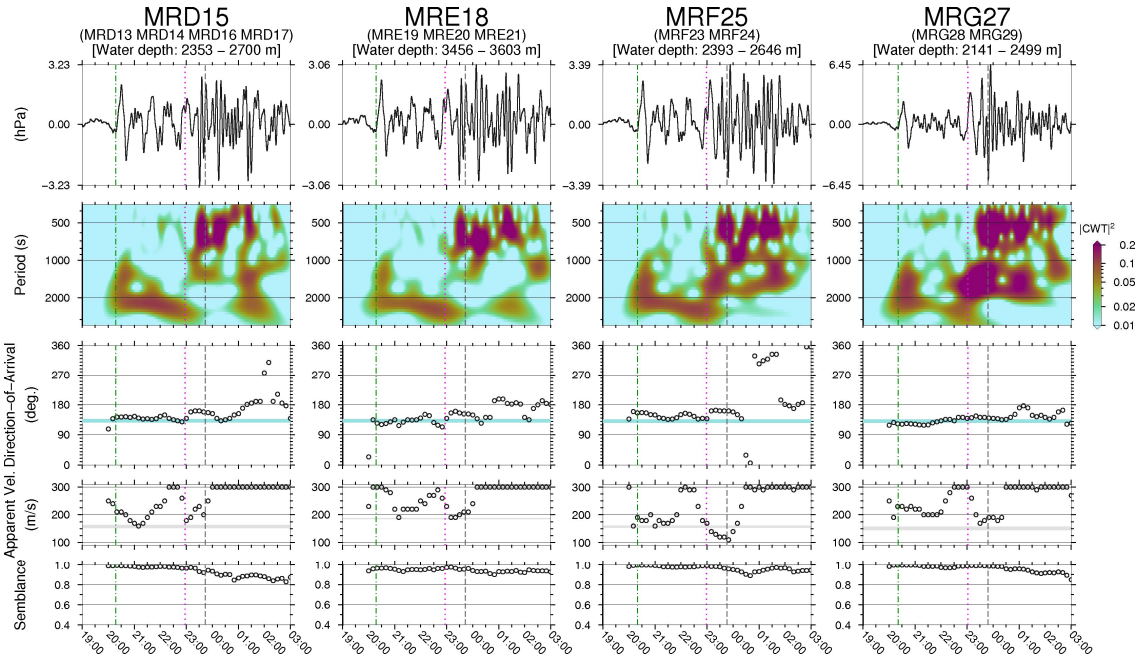

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19 Fig. A1

20 Ocean-bottom pressure waveforms and scalograms at S1N15, S1N04, S2N21, S2N08,

21 S3N17, S3N07, S4N22, S4N08, S5N07, KMB05, KMC10, KMD13, MRD15, MRE18,

MRF25, and MRG27. The results of the semblance analysis using waveforms at each station and their neighboring stations (listed in parentheses) are also shown. Cyan lines in the plots of direction-of-arrival indicate the direction of the great circle from each station to the Hunga Tonga – Hunga Ha'apai volcano. Gray shading in the plots of apparent velocity denotes the propagation velocity range expected for the water depth of the stations in each array. Gray broken lines indicate theoretical arrival times of direct tsunamis. Green and pink bars indicate the theoretical travel times assuming propagation along the great circle path from the Hunga Tonga–Hunga Ha'apai volcano with velocities of 300 and 220 m/s, respectively.

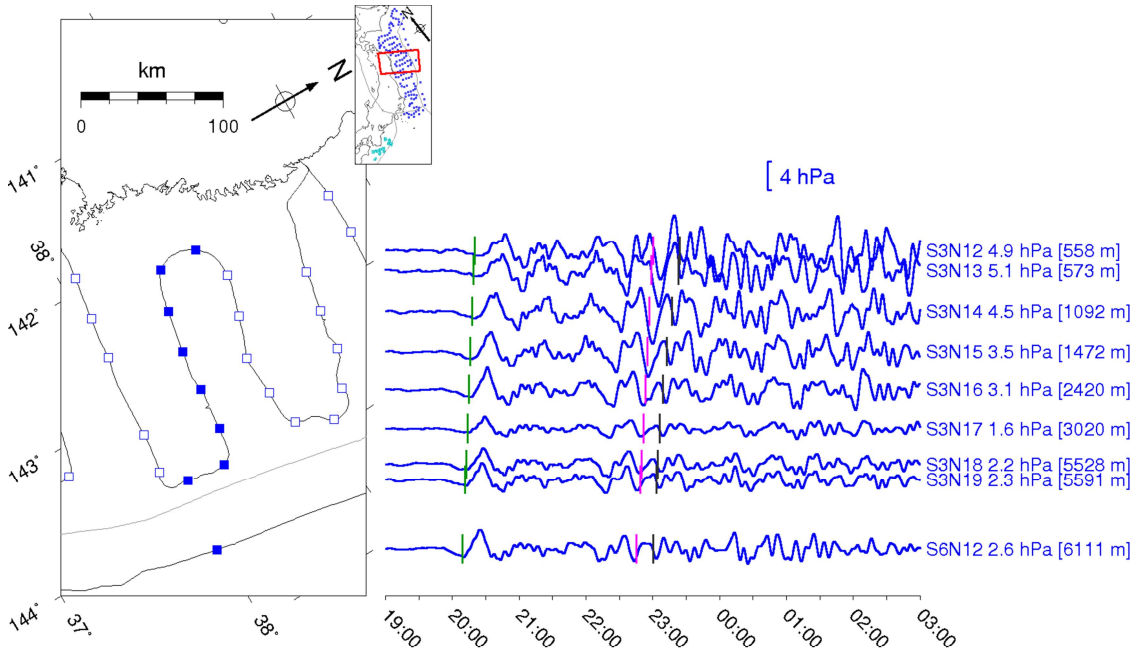
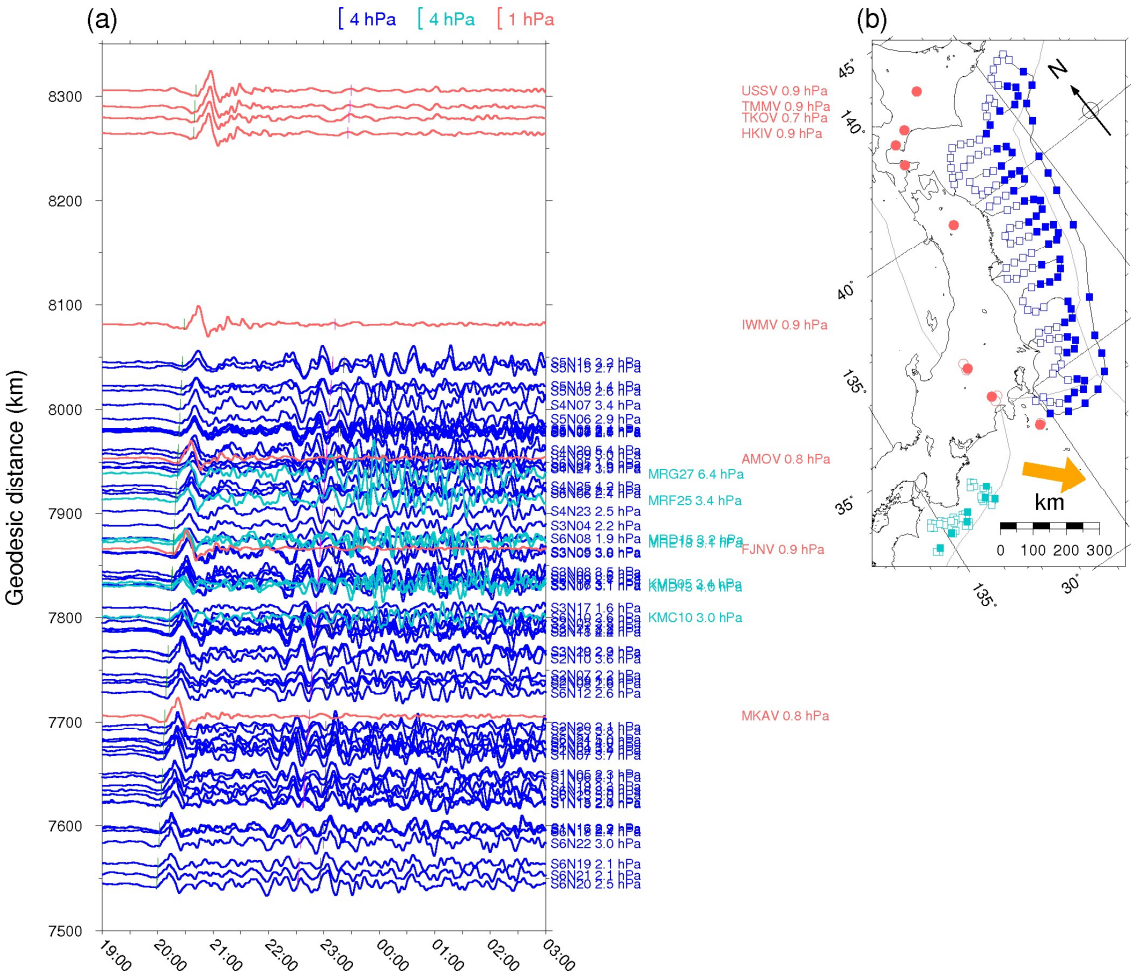


Fig. A2

Waveform trace of ocean-bottom pressure from near-trench S-net stations to near-coast S-net stations. Solid squares in the left map denote the stations for which waveform records are shown. Black bars indicate the theoretical arrival times of direct tsunamis. Green and pink bars indicate the theoretical travel times assuming the propagation along the great circle path from the Hunga Tonga–Hunga Ha'apai volcano at velocities of 300 and 220 m/s, respectively.



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42 Fig. A3

43 (a) Waveform trace of ocean-bottom pressure at S-net and DONET stations and

44 atmospheric pressure at V-net stations along the geodesic distance from the Hunga

45 Tonga–Hunga Ha'apai volcano. Blue and cyan lines denote waveform records of ocean-

46 bottom pressure gauges at S-net and DONET stations, respectively. Red broken lines

47 denote the waveform records of micro barometers at V-net stations. Black bars indicate

48 the theoretical arrival times of direct tsunamis. Green and pink bars indicate the

theoretical travel times assuming propagation along the great circle path from the Hunga Tonga–Hunga Ha'apai volcano at velocities of 300 and 220 m/s, respectively. (b) Station distribution of S-net, DONET, and V-net. Blue and cyan squares indicate S-net and DONET stations used in this study, respectively. Red circles indicate V-net stations used in this study. Solid squares and circles denote stations for which waveform records are shown in Fig. A2a.