Reviewer A

This is an interesting study that culminates in speculating on the source of the Tsunami. It is clearly and well written. I have two quick comments.

(1) Introduction Section: It would be useful to briefly summarize Sandanbata et al. (2023) and point out additional analysis/assessment being carried out by the present study.

(2) Line 151-153: “Potential sources were represented as the 2D Gaussian function with an amplitude of 1 m, a width (i.e., variance) of 4 km, and set on a regular grid each 0.04° in latitude and longitude”

How/why did the authors decide these values? Did they perform any sensitivity tests to evaluate the impact of this parameterization on their results?

Other minor comments (mostly English):

Abstract: “Declared”. Perhaps, “issued”.

“M4.9”. Is it Mw 4.9?

L50: “Declared”. Perhaps, “issued”.

L56: “..., this is…”, Perhaps, “..., which is…”

L56: This strongly suggests ….

Figure 1, caption: The orange lines show …

Figure 2: “ The blue lines …” I see only one blue line. But, it could be me. Is it that a black dashed line overlaps the other blue line? Perhaps, OBP records in a single color (green or so) could highlight these lines more.

Reviewer B (Ryo Okuwaki)

The submitted manuscript; "Potential Volcanic Origin of the 2023 short-period Tsunami in the Izu Islands, Japan" authored by A. Mizutani and D. Melgar, investigates an enigmatic tsunami event that occurred on 2023-10-08 in the southwest of Torishima Island, far-offshore Japan. The authors use the ocean-bottom pressure (OBP) records to identify a series of events during 20:00 and 24:00 on 2023-10-08 UTC. They calculate theoretical travel times of tsunami and acoustic (T-phase) waves from a prescribed source location to the OBP stations. They find a series of long-period (tsunami) and short-period (T-phase) wave packets that are coherently arrived in the time-shifted records based on their calculated travel times. They further invert for tsunami sources using the low-frequency tsunami waveforms at the OBP stations during the period when the largest tsunami waves are observed. They find their model with three sub-events can explain the observed tsunami waveforms better than the one with a single event. Based on their inverted sea-surface displacements, they discuss that a major deformation is adjacent to the western bulge of Sofugan active volcano, and the series of events that causes the deformation is related to the intermittent volcanic eruptions.

I find the submitted manuscript conducted a swift, yet thorough analyses of the OBP records, which lead to discovery of a series of events that are difficult to identify or investigate with the regular detection means. The source model built by the authors is also

interesting and informative to investigate the source location and a possible scenario, which will be a fundamental basis for further detailed investigation of source processes and wave propagation related to this enigmatic tsunami event. I only have minor comments below, which I hope will be useful for improving the manuscript.

Title

short-period -> Short-period

*use a capital letter "S"

Abstract

' "earthquake" swarm' reads a bit odd to me, because at the end, the authors suggest these events might be related to a series of volcanic eruptions, not just earthquakes (if I read correctly). So perhaps the readers (like me) may potentially be confused about the authors' use of "earthquake swarm", "sea-floor displacement", or "eruption" in the manuscript. I do not have a nice suggestion, but "swarm-like events" can be alternative here in the abstract at least.

L29

Please check if this "M4.9" event is still listed in the USGS catalog, which I could not find. Or the authors can refer to the corresponding event determined by the JMA with its origin at 2023-10-09T05:25 (JST) and an unidentified magnitude.

L35

I think it should be still unclear (or not easy to be conclusive) whether these events are just earthquakes (swarm) or eruptive events. I would delete this sentence and just explain that the DONET captures a series of T-waves here in the abstract.

Abstract in Japanese

I appreciate the authors for including a Japanese abstract. This is cool!

L40

10 月 9 日 -> 10 月 9 日 (JST)

L42

6 時 13 分 -> 6 時 13 分 (JST)

L44

モデルが観測記録をよく説明した -> モデルが、単一の津波生成を仮定したモデルに比して観測記録をより良く説明した

L55

I am missing this "4.9" event in the USGS catalog. It seems USGS lists the Mw 4.7 at around the similar origin time (please find the link below), but is it the one the authors mention here?

https://earthquake.usgs.gov/earthquakes/eventpage/us6000le2t/executive

L56--55

I would omit "strongly" and "at all", as the original sentence reads a bit too strong for me.

L66

the tsunami source model -> a tsunami source model

L84--86

Could it be possible to show some literature that can support the statement that the specific Japan and Izu-Bonin trenches could act as a waveguide in general?

L86--89

I would feel it should be too early to be deterministic about a link between the characteristics of spectrums and a possible source location. I agree with the authors that DONET records contain high-frequency contents shown in Figure 1b ("DONET" panel), but it should be still not so obvious if this can be corresponding to T-wave, unless the authors show short-period records and discuss the travel times of the associated phase of the ocean acoustic wave (which is done in the later sections and Figure 3 anyways).

I would suggest omitting lines at least in this section:

", which corresponds to the T wave or the ocean acoustic wave. We consider that this is because the Izu Islands are between the source and S-net."

I would also suggest omitting an orange circle and "T wave" label from Figure 1b ("DONET" panel).

L95

I could count ~13 events around the study region listed in the USGS catalog. Because the USGS events are used for direct priors and strong assumptions for the source location and sub-event timings in the authors' analyses, these events need to be clearly presented in the manuscript. Also in order to secure reproducibility of the authors' analyses (and Figures 2 and 3), could it be possible to show a supplementary list or figure (e.g., map or magnitude-time plot) of those events used for calculating the average location?

https://earthquake.usgs.gov/earthquakes/map/?extent=29.37799,139.32106&extent=30.14097,140.85915&range=search&timeZone=utc&search=%7B%22name%22:%22Search%20Results%22,%22params%22:%7B%22starttime%22:%222023-10-08%2000:00:00%22,%22endtime%22:%222023-10-08%2023:59:59%22,%22maxlatitude%22:29.96,%22minlatitude%22:29.56,%22maxlongitude%22:140.37,%22minlongitude%22:139.81,%22minmagnitude%22:0,%22orderby%22:%22time%22%7D%7D

*for downloading the same list of events in a CSV file, please follow the link below.

https://earthquake.usgs.gov/fdsnws/event/1/query.csv?starttime=2023-10-08%2000:00:00&endtime=2023-10-08%2023:59:59&maxlatitude=29.96&minlatitude=29.56&maxlongitude=140.37&minlongitude=139.81&minmagnitude=0&orderby=time

L95

Have you compared the USGS and JMA catalogs for the corresponding swarm-like events? If possible, please make a brief statement about how much the selection of event catalog (USGS or JMA) affects the resultant averaged source location.

L107

"20:25 UTC they" -> "20:25 UTC, they"

L109

"100-1000" -> "100–1000" or "100 to 1000"

*I would use "en-dash" for a range of values.

L113

What does this "disturbance" mean? Does it mean that the amplitude becomes large, or perhaps the traces become incoherent? Please clarify a definition of disturbance here as this might also be related to the analysis window used for inversion in the later section.

L117

Could it be possible to give specific information about this USGS' "M5.1" with its origin time? I think I'm missing which of the "black dashed line" to see in Figures 2 and 3.

L118--120

Out of curiosity, have the authors actually checked coherence of the records (e.g., perform multi-channel cross-correlation or just to stack the waveforms like back-projection)? Perhaps it might not be so easy to reject the possibility that those events are migrated, and if that happened, the coherence would have collapsed a bit. So I was wondering how the authors would think about a possibility of migration around the volcano or if those OBP records can be useful to resolve that possible small-scale migration of sources? Again, this is just out of my curiosity and nothing to ask for the authors in a revision.

L120: "later than the original estimation by the JMA."

I'm not so sure if this statement is required. JMA just reported that there was an earthquake at around 2023-10-09T05:25 (JST), but I think they did not explicitly say that origin time was

the origin time of the generation of the main tsunami wave. I would like to ask the authors to check JMA reports so that this authors' statement can be verified.

L124

I would write; "In the short-period records (Figure 3)" rather than "In the T wave records (Figure 3)".

L129

Similar to the comment on L120 above, the meaning of the word "origin time" here is not so obvious to me. I would write in a more narrative way, only documenting there is a T-wave arrival at around 21:09 UTC.

L130

Perhaps the USGS' mb 4.9 event (2023-10-08 21:09:16 (UTC)) might be related to the authors' identified event (red dashed line in Figures 2 and 3)?

https://earthquake.usgs.gov/earthquakes/eventpage/us6000lf48/executive

L133

Could you give more specific information about data used for inversion? Have the authors used the same dataset as shown in Figure 2, i.e., pre-processed, 100 to 1000 period bandpass filtered OBP records at 42 stations?

L157

Perhaps the one can strengthen here that the model prescribes the sub-event timings (as a strong prior*), and the sub-event timings are not considered as a model parameter to be solved in inversion by the authors study, whilst one can potentially estimate sub-event timings (e.g., Sandanbata et al., 2023, preprint, https://doi.org/10.22541/essoar.169878726.62136311/v1) if Green's functions are reliable enough for stable deconvolution.

*I still think this should be a reasonable prior though.

L172

How many OBP stations (traces) were randomly kept (or thrown away) during bootstrapping exercise (e.g., ~80% of the stations used for the optimal model)?

L186--187

I notice in Figure S7 that even the optimal, multiple source model tends to have smaller amplitude of the synthetics than the observed ones. I would like to ask the authors to give a couple of lines to discuss a possible cause to explain this discrepancy between the observed and synthetic waveforms somewhere in the Discussion section. For example, this may suggest a necessity to include some more tsunami sources before 21:13 UTC in the model?

L192

Please show a reference for the Sofugan volcano. Perhaps from the Japan Coast Guard?

https://www1.kaiho.mlit.go.jp/kaiikiDB/kaiyo17-2.htm

L197

I am not sure if this statement "the vent closed at 21:21 UTC" can only be supported by the authors' study alone. Given the limited observational basis around the Sofugan, I feel it might be too strong to say the vent is closed only from the USGS event catalog or the authors' tsunami modeling. It seems JAMSTEC has deployed OBS there after the event, which will lead to discovery of some extra in future, so I would suggest toning down the statement about a possible closure of the vent.

L207

the largest tsunami was not 20:25 UTC -> the largest tsunami was not likely 20:25 UTC

L207

(*Similar to the comment on L120 above)

JMA just reported that there was an enigmatic "earthquake" at 20:25 UTC (which was hard to estimate its source or magnitude) and they observed a tsunami, but, if my understanding is correct, it seems unclear whether the JMA really concluded a causal relationship between the occurrence of that event and the tsunami. In this sense, it might be misleading to say "The origin time of the largest tsunami was not 20:25 UTC (5:25 JST) which was estimated by the JMA".

Also, I think the authors' study alone still cannot reject a scenario that the possible event at 20:25 UTC (also) contributed to the tsunami generation, as those events are not included in the authors' tsunami model*. So again, the conclusion may read a bit too strong for me, and it can just be more narrative about the authors' finding themselves.

*I understand that the authors' focus here is on the largest tsunami, and other time windows will further be investigated in separate studies.

General comment on figures

A Fast Reports article usually accepts 2 or 3 display items. Could it be possible to decrease the number of figures? For example, I would put Figures 2 and 3 together into one figure; Figure 2a for the long-period records, Figure 2b for the spectrogram, and Figure 2c for the short-period records.

https://seismica.library.mcgill.ca/author-guidelines

Figure 1

In order to ensure reproducibility of figure, please show the following in the caption:

Reference(s) for the orange lines in the caption. JMA?

Reference(s) for the location of the pumice raft in the caption. JAMSTEC?

Reference(s) of the topography/bathymetry data on a map. ETOPO1?

S2+S3+S4+S5

Perhaps the use of plus "+" might mislead the readers (e.g., as somewhat the authors sum up the spectrums). I would show "S2, S3, S4, S5" instead.

Figures 2 and 3

I like these figures. (this is just a comment.)

Supplementary material

It seems that the title used in the supplementary material looks different from the one used in the main text. Please make sure that the authors use the same title as the main text.

Figure S1

Gray dots are too small to recognize. Could you make it large a bit?

Figure S2

I would write "S6N20, S6N22, …" on the left panel.

Figure S3

that used -> used (or that are used)

Figure S3

Please make sure if the panels (b) represent the ones from the single-source model (Figure S6?). If so, the caption; "(b) Figure S3" -> "(b) Figure S6".

Figure S6

"Displacement" for the color map label could be "Sea surface displacement"?

Figure S7

I would appreciate the authors could use the consistent description of their modeling. For example, "simple inversion" could be "single-source inversion"?

Response to reviewers

Summary of the revision

The USGS earthquake catalog used in the original manuscript had been updated, so we revised the manuscript based on the latest catalog, which is shown in Table S1 in Supporting Information. We also changed our paper to clarify the results and corrected some grammatical errors pointed out by reviewers.

Reviewer A

1. *Introduction Section: It would be useful to briefly summarize Sandanbata et al. (2023) and point out additional analysis/assessment being carried out by the present study.*

   Because their paper is still under review, we consider that referring to it in the Introduction Section is difficult. We want to start our paper with confirmed statements. We therefore summarized their results in Section 4 (L166-168).

2. *Line 151-153: "Potential sources were represented as the 2D Gaussian function with an amplitude of 1 m, a width (i.e., variance) of 4 km, and set on a regular grid each 0.04° in latitude and longitude". How/why did the authors decide these values? Did they perform any sensitivity tests to evaluate the impact of this parameterization on their results?*

   In this study, we used the bathymetry data with a spatial interval of 0.02 deg. The source width (4 km) and the source interval (0.04 deg) are the minimum values that can be used in this condition, and we did not conduct any sensitivity test.

3. *Abstract: "Declared". Perhaps, "issued".*

   Revised (L28).

4. *Abstract: "M4.9". Is it Mw 4.9?*

   That is the body wave magnitude (Mb). As in the answer to comment 3 by Reviewer 2, we changed the text to agree with the latest USGS earthquake catalog, so that M4.9 was to be Mw 4.7.

5. *L50: "Declared". Perhaps, "issued".*

   Revised (L50).

6. *L56: "..., this is…", Perhaps, "..., which is…"*

   Revised (L58).

7. *L56: This strongly suggests ….*

   Revised (L59).

8. *Figure 1, caption: The orange lines show …*

   Revised.

9. *Figure 2: " The blue lines …" I see only one blue line. But, it could be me. Is it that a black dashed line overlaps the other blue line? Perhaps, OBP records in a single color (green or so) could highlight these lines more.*

   We changed the OBP records to be in a single color (Figure 2).

Reviewer B (Ryo Okuwaki)

1. *Title: short-period -> Short-period *use a capital letter "S".*

   Revised.

2. *Abstract: '"earthquake" swarm' reads a bit odd to me, because at the end, the authors suggest these events might be related to a series of volcanic eruptions, not just earthquakes (if I read correctly). So perhaps the readers (like me) may potentially be confused about the authors' use of "earthquake swarm", "sea-floor displacement", or "eruption" in the manuscript. I do not have a nice suggestion, but "swarm-like events" can be alternative here in the abstract at least.*

   Revised (L35).

3. *L29: Please check if this "M4.9" event is still listed in the USGS catalog, which I could not find. Or the authors can refer to the corresponding event determined by the JMA with its origin at 2023-10-09T05:25 (JST) and an unidentified magnitude.*

   We found that the USGS source catalog was updated on December 11 as shown in the list below. In this revision, we used the latest version of the catalog and adopted it in Supporting information (Table S1).

	Present catalog (Dec 13, 2023)	Used in the original draft
time	2023-10-08T20:25:22.652Z	2023-10-08T20:25:22.661Z
latitude	29.7121	29.7105
longitude	139.9258	139.9298

depth	10	10
mag	4.7	4.9
magType	mww	mb
nst	71	71
gap	73	73
dmin	3.279	3.276
rms	0.72	0.73
net	us	us
id	us6000le2t	us6000le2t
updated	2023-12-11T21:25:58.040Z	2023-10-12T19:05:29.040Z
place	Izu Islands, Japan region	
type	earthquake	earthquake
horizontalError	7.73	7.73
depthError	1.794	1.794
magError	0.078	0.076
magNst	16	54
status	reviewed	reviewed
locationSource	us	us
magSource	us	us

4. *L35: I think it should be still unclear (or not easy to be conclusive) whether these events are just earthquakes (swarm) or eruptive events. I would delete this sentence and just explain that the DONET captures a series of T-waves here in the abstract.*

   Revised as 'swarm-like seismic event' (L35). Because the USGS detects these events by their seismic stations, we considered that it is better than "a series of T waves".

5. *L40: 10 月 9 日 -> 10 月 9 日 (JST)*

   Revised (L40).

6. *L42: 6 時 13 分 -> 6 時 13 分 (JST)*

   Revised (L42).

7. *L44: モデルが観測記録をよく説明した -> モデルが、単一の津波生成を仮定したモデルに比して観測記録をより良く説明した*

   Revised (L44-46).

8. *L55: I am missing this "4.9" event in the USGS catalog. It seems USGS lists the Mw 4.7 at around the similar origin time (please find the link below), but is it the one the authors mention here?*
   https://earthquake.usgs.gov/earthquakes/eventpage/us6000le2t/executive

   As in the answer to comment 3, the USGS earthquake catalog was updated after we wrote the original manuscript (e.g., M4.9 has become Mw 4.7). We revised our paper based on the latest catalog.

9. *L56—55: I would omit "strongly" and "at all", as the original sentence reads a bit too strong for me.*

   Revised (L59-60).

10. *L66: the tsunami source model -> a tsunami source model*

    Revised (L68).

11. *L84—86: Could it be possible to show some literature that can support the statement that the specific Japan and Izu-Bonin trenches could act as a waveguide in general?*

    We newly referred to Heidarzadeh and Stake (2014), which confirmed the mechanism of the tsunami trapping in the Philippine Sea plate (L88-89).

12. *L86—89: I would feel it should be too early to be deterministic about a link between the characteristics of spectrums and a possible source location. I agree with the authors that DONET records contain high-frequency contents shown in Figure 1b ("DONET" panel), but it should be still not so obvious if this can be corresponding to T-wave, unless the authors show short-period records and discuss the travel times of the associated phase of the ocean acoustic wave (which is done in the later sections and Figure 3 anyways). I would suggest omitting lines at least in this section: ", which corresponds to the T wave or the ocean acoustic wave. We consider that this is because the Izu Islands are between the source and S-net."*

    We changed the text to state that the high-frequency component was only observed at DONET (L89-91) and moved the statement about T wave to a later section (L128-136).

13. *I would also suggest omitting an orange circle and "T wave" label from Figure 1b ("DONET" panel).*

    Since we confirm that the high-frequency component of DONET OBP records corresponds to T wave (L128-136), we do not have to remove the “T wave” label in Figure 1b.

14. *L95: I could count ~13 events around the study region listed in the USGS catalog. Because the USGS events are used for direct priors and strong assumptions for the source location and sub-event timings in the authors' analyses, these events need to be clearly presented in the manuscript. Also in order to secure reproducibility of the authors' analyses (and Figures 2 and 3), could it be possible to show a supplementary list or figure (e.g., map or magnitude-time plot) of those events used for calculating the average location?*

    We added the earthquake catalog used in this study in Supporting information (Table S1).

15. *L95: Have you compared the USGS and JMA catalogs for the corresponding swarm-like events? If possible, please make a brief statement about how much the selection of event catalog (USGS or JMA) affects the resultant averaged source location.*

    Unfortunately, this swarm-like event was not written in the JMA catalog (https://www.data.jma.go.jp/svd/eqev/data/daily_map/20231009.html; note that the events occurred from 4:53 to 6:21 October 9 (JST)), so that we cannot compare with the USGS catalog.

16. *L107: "20:25 UTC they" -> "20:25 UTC, they"*

    Revised (L110)

17. *L109: "100-1000" -> "100–1000" or "100 to 1000"*

    Revised from hyphen to en dash (L113).

18. *L113: What does this "disturbance" mean? Does it mean that the amplitude becomes large, or perhaps the traces become incoherent? Please clarify a definition of disturbance here as this might also be related to the analysis window used for inversion in the later section.*

    We used the term “disturbance” as the amplitude becomes large or the arrival of a

large tsunami. We changed the text to clarify it (L116).

19. *L117: Could it be possible to give specific information about this USGS' "M5.1" with its origin time? I think I'm missing which of the "black dashed line" to see in Figures 2 and 3.*

    The M5.1 earthquake (Mb 5 earthquake in the revised version) occurred at 21:13 UTC. At the top of Figure 2, there is an arrow indicating the time and we changed the colors of the OBP waveforms.

20. *L118—120: Out of curiosity, have the authors actually checked coherence of the records (e.g., perform multi-channel cross-correlation or just to stack the waveforms like back-projection)? Perhaps it might not be so easy to reject the possibility that those events are migrated, and if that happened, the coherence would have collapsed a bit. So I was wondering how the authors would think about a possibility of migration around the volcano or if those OBP records can be useful to resolve that possible small-scale migration of sources? Again, this is just out of my curiosity and nothing to ask for the authors in a revision.*

    No, the coherence of pressure records was not confirmed quantitatively.

21. *L120: "later than the original estimation by the JMA." I'm not so sure if this statement is required. JMA just reported that there was an earthquake at around 2023-10-09T05:25 (JST), but I think they did not explicitly say that origin time was the origin time of the generation of the main tsunami wave. I would like to ask the authors to check JMA reports so that this authors' statement can be verified.*

    In the press release titled “Press release about the earthquake near Tori-shima Island at 05:25 on October 9, 2023” (https://www.jma.go.jp/jma/press/2310/09a/kaisetsu202310090840.pdf), they gave the information about the earthquake at 2023-10-09T05:25 (JST) and the observed tsunami. This might be because the JMA considered that the tsunami occurred by this earthquake, or the origin time of the tsunami was 05:25 (JST). On the other hand, they did not explicitly insist on the tsunami origin time. We, therefore, removed the statement about the origin time by the JMA (L126).

22. *L124: I would write; "In the short-period records (Figure 3)" rather than "In the T wave records (Figure 3)".*

    As in the answer to comment 12, we revised the text to confirm that the short-

period records should be T wave in L128-131, so that we use “high-frequency OBP records” here (L127).

23. *L129: Similar to the comment on L120 above, the meaning of the word "origin time" here is not so obvious to me. I would write in a more narrative way, only documenting there is a T-wave arrival at around 21:09 UTC.*

    The seismic event that occurred at 21:09 was not listed in the old USGS catalog, but it is in the latest one, so we removed this sentence (L136-139).

24. *L130: Perhaps the USGS' mb 4.9 event (2023-10-08 21:09:16 (UTC)) might be related to the authors' identified event (red dashed line in Figures 2 and 3)? https://earthquake.usgs.gov/earthquakes/eventpage/us6000lf48/executive*

    Yes, it is. As same as the answer to comments 3, 8, and 23, we revised our manuscript based on the latest USGS catalog.

25. *L133: Could you give more specific information about data used for inversion? Have the authors used the same dataset as shown in Figure 2, i.e., pre-processed, 100 to 1000 period bandpass filtered OBP records at 42 stations?*

    We applied the same pre-processing and the band-pass filter in Figure 2 but used not only the stations of DONET but also the ones of S-net. We added the explanation (L162-163).

26. L157: Perhaps the one can strengthen here that the model prescribes the sub-event timings (as a strong prior*), and the sub-event timings are not considered as a model parameter to be solved in inversion by the authors study, whilst one can potentially estimate sub-event timings (e.g., Sandanbata et al., 2023, preprint, https://doi.org/10.22541/essoar.169878726.62136311/v1) if Green's functions are reliable enough for stable deconvolution. *I still think this should be a reasonable prior though.

    We added the explanation about Snadanbata et al. (2023) (L166-168).

27. *L172: How many OBP stations (traces) were randomly kept (or thrown away) during bootstrapping exercise (e.g., ~80% of the stations used for the optimal model)?*

    We selected the stations completely random, i.e., did not set the hold-on or thrown-away rate for the bootstrap method.

28. *L186—187: I notice in Figure S7 that even the optimal, multiple source model tends to have smaller amplitude of the synthetics than the observed ones. I would like to ask the authors to give a couple of lines to discuss a possible cause to explain this discrepancy between the observed and synthetic waveforms somewhere in the Discussion section. For example, this may suggest a necessity to include some more tsunami sources before 21:13 UTC in the model?*

    We added the discussion about the amplitude disagreement between the model and observed waveforms (L205-209).

29. *L192: Please show a reference for the Sofugan volcano. Perhaps from the Japan Coast Guard? https://www1.kaiho.mlit.go.jp/kaiikiDB/kaiyo17-2.htm*

    We added the reference from the Geological Survey of Japan (L216).

30. *L197: I am not sure if this statement "the vent closed at 21:21 UTC" can only be supported by the authors' study alone. Given the limited observational basis around the Sofugan, I feel it might be too strong to say the vent is closed only from the USGS event catalog or the authors' tsunami modeling. It seems JAMSTEC has deployed OBS there after the event, which will lead to discovery of some extra in future, so I would suggest toning down the statement about a possible closure of the vent.*

    As you commented, discussing the vent is too speculative, so we changed the text to 'the eruption ended at 21:21 UTC' (L221).

31. *L207: the largest tsunami was not 20:25 UTC -> the largest tsunami was not likely 20:25 UTC.*

    We removed that statement (L232-233; please see the answer to comment 32).

32. *L207: (*Similar to the comment on L120 above) JMA just reported that there was an enigmatic "earthquake" at 20:25 UTC (which was hard to estimate its source or magnitude) and they observed a tsunami, but, if my understanding is correct, it seems unclear whether the JMA really concluded a causal relationship between the occurrence of that event and the tsunami. In this sense, it might be misleading to say "The origin time of the largest tsunami was not 20:25 UTC (5:25 JST) which was estimated by the JMA". Also, I think the authors' study alone still cannot reject a scenario that the possible event at 20:25 UTC (also) contributed to the tsunami generation, as those events are not included in the authors' tsunami model*. So again, the conclusion may read a bit too strong for me, and it can just be more narrative about the authors' finding*

*themselves. *I understand that the authors' focus here is on the largest tsunami, and other time windows will further be investigated in separate studies.*

As same as the answer to comment 21, we removed the statement of the origin time by JMA.

33. *A Fast Reports article usually accepts 2 or 3 display items. Could it be possible to decrease the number of figures? For example, I would put Figures 2 and 3 together into one figure; Figure 2a for the long-period records, Figure 2b for the spectrogram, and Figure 2c for the short-period records.*

    We merged Figures 2 and 3 (Figure 2 in the revised manuscript).

34. *Figure 1: In order to ensure reproducibility of figure, please show the following in the caption: Reference(s) for the orange lines in the caption. JMA? Reference(s) for the location of the pumice raft in the caption. JAMSTEC? Reference(s) of the topography/bathymetry data on a map. ETOPO1?*

    Captions are added to Figure 1.

35. *Figure 1: S2+S3+S4+S5: Perhaps the use of plus "+" might mislead the readers (e.g., as somewhat the authors sum up the spectrums). I would show "S2, S3, S4, S5" instead.*

    We changed the legend in Figure 1.

36. *Supplementary material: It seems that the title used in the supplementary material looks different from the one used in the main text. Please make sure that the authors use the same title as the main text.*

    We changed the title to the same as the main text. Thank you for your notification.

37. *Figure S1: Gray dots are too small to recognize. Could you make it large a bit?*

    We enlarged the size of the gray stations (Figure S1).

38. *Figure S2: I would write "S6N20, S6N22, …" on the left panel.*

    We changed the legend in Figure S2.

39. *Figure S3: that used -> used (or that are used)*

    Revised.

40. *Figure S3: Please make sure if the panels (b) represent the ones from the single-source*

model (Figure S6?). If so, the caption; "(b) Figure S3" -> "(b) Figure S6".

You are right. Figure S3b is for Figure S6. We appreciate your comment.

41. *Figure S6: "Displacement" for the color map label could be "Sea surface displacement"?*

We revised the color map label to “Sea surface displacement”.

42. *Figure S7: I would appreciate the authors could use the consistent description of their modeling. For example, "simple inversion" could be "single-source inversion"?*

We revised the caption to “single-source inversion”.