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MARINE

Ancona, 22.06.2023

To the Editor of
Earth System Science Data (ESSD)

Dear Editor,

Please, find enclosed a revsed version of the manuscript “essd-2022-458” Penna et al., submitted for consideration to *Earth System Science Data* as Data description paper; following the reviewers' comments the paper is now entitled: **“Dataset of Depth/Temperature profiles obtained from 2012 to 2020 using commercial fishing vessels of the AdriFOOS fleet in the Adriatic Sea”**.

The paper and the related dataset have been thoroughly revised following the valuable comments of the two reviewers and those available in the interactive discussion; we think that this process significantly improved the original version of the manuscript and hope that this could now be considered suitable for publication on ESSD. The responses to the general comments of the two reviewers have already been published in the interactive discussion, but below you will find the answers (in red) to all the detailed comments (in black) and also attached a "track changes" version of the manuscript useful for verifying the resulting changes.

For any request, please do not hesitate to contact us at the email address below.

Looking forward to hearing from you soon,

Best regards,

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Review of 'Dataset of Depth/Temperature profiles obtained in the period 2012-2020 using commercial fishing vessels of the AdriFOOS fleet in the Adriatic Sea (Mediterranean Sea)' by Penna et al.

Responses to detailed comments of Anonymous Referee #1

Comment: Title:

'obtained in the period' could be phrased more simply as 'from 2012-2020'

Is 'Mediterranean Sea' necessary?

Answer: *Thanks for the suggestions, the title has been rephrased accordingly.*

Comment: Abstract

It would be easier for the reader if you moved the second sentence in the abstract up to be the first sentence. For example,

In the last decade an enormous amount of georeferenced oceanographic (temperature and pressure) data has been collected through the use of commercial fishing vessels operating in the Adriatic Sea. This data is co-located with catch data. This document describes….

Before AdriFOOS please add 'fishing fleet infrastructure (AdriFOOS) to make it easier for the reader.

Please avoid/ remove many of the acronyms (CNR, IBRIM) spell out acronyms that are used infrequently and don't bother using the acronym.

Answer: *Thanks for the suggestions, the abstract has been rephrased accordingly.*

Comment: Line 26 what does 'Ancona Section' mean is this detail necessary? It sounds like an ocean transect.

Answer:*Thanks for the suggestion, the word "section" has been replaced with "branch"; indeed it is necessary to specify this because previously this office/branch belonged to another institute which was often mentioned in old documents and for this reason we already experienced some issues in content attribution.*

Comment: Line 30: replace ' see below' with 'see Section 2'

Answer:*Thanks for the suggestion, the text has been changed accordingly.*

Comment: Line 32: remove 'that demonstrated to be'

Answer:*Thanks for the suggestion, the text has been removed accordingly.*

Comment: Line 37:'An updated….' It is not clear what is the update and what was the previous system.

Answer:*Thanks for the suggestion, the text has been rephrased accordingly.*

Comment: Line 42: what are 'different FOOS modular conformations' please expand. I don't think conformation is the correct word, but I don't understand what you are saying.

Answer:*Thanks for the comment, the word "conformations" has been replaced with "setups" and it is now better specified in the text where to find some setup examples."*

Comment:

Line 47: replace 'besides' with 'in addition' (is this what you mean?)

Line 48: replace 'by' with 'of' and 'in land' with 'on land' or 'land based'

Line 50: replace 'along' with 'through'

Answer:*Thanks for all the suggestions above, the text has been changed accordingly.*

Comment:

Line 60: remove 'the' from 'the fishing'. Replace 'paragraph' with 'section'. Is 3.1 the correct section reference? I can't see the three phases referred to in section 3.1.

Line 60-61: In the interest of using standardised language and working towards best practices, I suggest you change the wording of the three phases as follows.

'profile' change to 'down cast'

'permanence on the bottom' change to 'horizontal profile' either on the bottom (or at the depth at which the fishing gear operates) and

'ascent' change to 'up cast'

Answer:*Thanks for the wise suggestions above, text at the lines 60-61 has been rephrased accordingly; reference to section 3.1 still stays on due to the description of a fishing operation given at the end of it and profiles nomenclature has been changed throughout the text (where needed).*

Comment:

Line 63 "Recently, a dataset containing 14810 depth (pressure)/temperature profiles has been made accessible (Penna et al., 2020);" How is this paper and dataset different to Penna et al 2020, and the dataset that is included? ? Or if this paper describes this dataset, state that.

I see on lines 274-275 that you state a difference between the formatting of the two datasets. Is this all (CSV versus netcdf?) I suggest that you put this up front in the introduction (Line 63) where I first had this question. Again on line 319 I still don't understand the difference between the 2 different datasets.

Answer:*We have tried to make it clearer now in the text, but probably there was a misunderstanding here, in fact this article describes the data set available in SEANOE at: "Penna Pierluigi, Belardinelli Andrea, Croci Camilla Sofia, Domenichetti Filippo, Martinelli Michela (2020).* ***AdriFOOS Depth/Temperature profiles dataset 2012-2020****. SEANOE. https://doi.org/10.17882/73008"; this is the way the repository requests to cite the contribution even if this is not a paper but a dataset with a very short textual introduction.*

Comment:

Line 68: replace model with models

Line 70: - the main aim of this paper is to is to specifically describe the collection, storage, quality assurance and control procedures

Answer:*Thanks for the suggestions above, the text has been changed accordingly.*

Comment: Line 71: – replace 'above mentioned' with 'dataset of Penna et al 2020' if indeed it is the same dataset.

Answer: *Done, in line with the explanations given above, following the comments on line 63.*

Comment: Line 77: replace 'large' with 'wide'

Answer:*Thanks for the suggestion, the text has been replaced accordingly.*

Comment: Line 101: I don't understand the reference to 'inland server'. Is this a server on the ship? Or is it a land based data centre? Please clarify throughout the paper, and also identify in Figure 2. You talk about 3 functional components, perhaps draw boxes around the 3 components in Figure 2. Perhaps I mis-understood that the logos are the data centres

Answer: *To be consistent with the changes made according to one of the previous comments and also with the nomenclature used in the figure, "inland server" has been changed to "on land datacenter" throughout the text (where needed); Figure 2 has been modified according to the given suggestions.*

Comment: Line 78-79: remove capital letters on northern southern and central, not proper nouns.

Answer: *Thanks for the suggestion, capital letters on cardinal points have been removed throughout the text.*

Comment: Lines 75-90: I am not sure if all this detail is needed for the data descriptor paper.

Answer: *The description of the study area was intended to help explain the usefulness of this dataset in such a complex, very characteristic and important context within the Mediterranean.*

Comment: Line80: Please include the sills that are referred to and the Ionian Sea, Otranto… on Figure 1 if it is important, or delete. Do we need to know all these names for a data paper, if so, mark on Figure 1, otherwise delete? Likewise Po River.

Answer: *Figure 1 has been modified accordingly.*

Comment: Line 84: after (Poulin, 2001) add '.'

Answer: *Thanks and sorry for this and other typos throughout the text.*

Comment: Lines 80-95: I don't' think we need this much detail here. It is not necessary as per the aims of the paper on line 70. You could add in the introduction a single sentence stating the region is important for fisheries.

Answer: *Please find answers to previous comments above.*

Comment: Line 103: add these three core components to Figure 2.

Answer: *Figure 2 has been modified according to the given suggestions.*

Comment: line 110: replace gears with gear. Always singular in this context.

Answer: *Thanks for the suggestion, the term has been changed accordingly throughout the text (where needed).*

Comment: Line 111: what is the other 'reliable oceanographic data'. expand or delete.

Answer: *Thanks for the suggestion, the text has been changed and we hope it is clearer now.*

Comment: Line 114: do we need to know 'Polytetrafluoroethylene (PTFE)', could you replace with 'plastic'

Answer: *Thanks for the comment, the text has been replaced accordingly.*

Comment:

Line 114: replace gears with gear.

Line 116: new paragraph at 'Since'

Line 120: replace 'paragraph' with 'section'.

Answer: *Thanks for the suggestions above, the text has been changed accordingly.*

Comment: Line 122: What is a concentrator hub? Describe what it does ?

Answer: *Thanks for the suggestion, an explanation has been added in the text.*

Comment: Lines 123-135 See comments above re down cast, horizontal profile and up cast.

Answer: *Thanks for the suggestion, the text has been changed accordingly throughout the text.*

Comment: Line 3.3 change Inland to Land based?

Answer: *According to other comments above it has been changed to "On land datacenter".*

Comment: Line 165-170, Section 3.3.1 delete or move

Answer: *Section 3.3 has been strongly reduced following the reviewers' suggestions and some information was moved to supplemental materials however taking into account all relevant comments below.*

Comment: Line 173 change validated to QC'd ? Is this what you mean?

Answer: *Actually what we mean for Validation and quality control is explained in section 4, thus it's probably better not to anticipate the concept of QCing; reference to section 4 has been added in the text; section 4 was strongly revised according to reviewers suggestions.*

Comment: Line 178 what does ‘specular’ mean? ‘mirrored’? (and line 198)

Answer: *Thanks for the suggestion, the term “mirrored” has been adopted in text at lines 178 and 188.*

Comment: Line 178 change crypted to encrypted?

Answer: *Thanks for the suggestion, the text has been changed accordingly.*

Comment: Line 184 – GSP do you mean GPS?

Answer: *Sorry for the typo, the text has been adjusted.*

Comment: Line 185 change fishermen to fishers

Answer: *Thanks for the hint, we changed here with fishers as suggested, however “fishermen” is the term that we usually adopt in our scientific literature.*

Comment: Line 190 validated? Do you mean QC’d ?

Answer: *Please find above the reply to a similar comment.*

Comment: Line 190 what is ‘paragraph’ 4? Do you mean section?

Answer: *Thanks for the suggestions, the text has been changed accordingly.*

Comment: Line 191 the validation / QC flags are important where are they described? What are the codes and the data quality assignment? Where is this described (This is the sort of information that belongs in this paper and is very important for data re-use and interoperability.)

Answer: *Section 4 has been heavily revised following this and other comments by both reviewers and now the flags are described in section 4.2 and referenced in the text; furthermore flag codes are also reported in the metadata section of the dataset.*

Comment: As stated above, although interesting, I don’t feel section 3 really belongs here in the data paper.

Answer: *We decided to to reduce section 3.3 and move most of the information into the supplemental materials however taking into account all relevant comments made by both reviewers (e.g. access to the web interface was also provided).*

Comment: Line 220 Section 4 What are the accuracies and precisions of the sensors? Is this information in the data files as well

Answer: *Thanks for the suggestion, actually the accuracy of the sensors was already declared at line 110 (and for your convenience we add a table below), but it’s relevant to add it as metadata in the data files and explain it in the text. Indeed, as also suggested in the general comments, we took into account the comments posted by Dr. Michael Hemming in the discussion and uploaded the new CF-1.7 compliant netcdf dataset into the SEANOE asset (https://doi.org/10.17882/73008); This dataset has been checked for compliance using the IOOS Compliance Checker Tool (https://compliance.ioos.us/index.html). Furthermore, the dataset available in ODV format trough the same asset (as indicated here: https://essd.copernicus.org/preprints/essd-2022-*

458/) has also been updated with more metadata (e.g. measurement range) and sensor information (e.g.producer, type, precision and accuracy). This information was also added in the Section 5 (data record) text.

Temperature range °C	**-5 to +35**
Temperature accuracy °C	**±0.05**
Temperature Response Time 63% (s)	**<0.5**
Depth range(m)	**300**
Depth accuracy	**±0.3% full scale**
Salinity range (psu)	**2–42**
Salinity accuracy (psu)	**±0.1**
Maximum acquisition rate (s)	**1**

Table 1. Main characteristics of the NKE sensors declared by the manufacturer.

Comment: Line 225 What QC steps are carried out? This information is important for the user.

Answer: *Thanks for the comment, section 4 has been heavily revised following this and other comments by both reviewers and we hope that now all QC steps are more clear.*

Comment:

Line 227 as per Line 60-61: In the interest of using standardised language I suggest you change the wording of the three phases as follows

'profile' change to 'down cast'

'permanence on the bottom' change to 'horizontal profile' either on the bottom (or at the depth at which the fishing gear operates) and

'ascent' change to 'up cast'

Answer: *Terms have been changed accordingly.*

Comment: Line 242 what are the spike criteria

Answer:*Thanks for the comment, the spike criteria have now been defined in section 4.3.*

Comment: Lines 245-250, this is the opportunity to really clarify what QC has been done on the data. What does 'flagging of wrong profiles' mean? How is it determined they are wrong (and then the example of Figure 7 is not flagged?) what are the exact tests, and how are they implemented. This information is really important for data users. Then you state that visual inspection is the most delicate part of the process, so these tests and inspections should really be articulated clearly so that there is continuity in the datasets.

Answer: *Thanks for the very relevant comment, Figure 7 now is Figure 5 and section 4 has been heavily revised following this and other comments by both reviewers; indeed we now tried to better specify all the steps used for QC and, in the aim to be as clear as possible, created new had hoc sections in the text: 4.1*

Field test of sensors and evaluation of the offset, 4.2 Quality flags in use, 4.3 Automatic validation procedures, 4.4 Visual inspections, 4.5 Other quality check procedures featured in AdriFOOS.

Comment: Line 253 change 'All flags used follow the NERC Vocabulary server standard L20 vocabulary provided by Seadatanet measurand qualifier flags (Seadatanet 2022)'. Please state what they are for the reader so there is no need to go and look them up.

Answer: *Thanks for the comment, we now specified all flag codes used in Table 1 within the new section "4.2 Quality flags in use".*

Comment: Line 264 'during the permanence of the fishing gears close to the bottom'? What does this mean? Change language as per above.

Answer:*Terms have been changed in horizontal profiles and up casts as suggested above.*

Comment: Line 265 change woth to worth.

Answer: *Sorry for the typo, the text has been adjusted.*

Comment: Lines 333-339 and Figure 13 Please include how many data points are used for each section? It may not be feasible to call it a 'season' if there is insufficient data coverage.

Answer: *Thanks for the comment, the number of data points has been now added in the text for each considered season; Figure 13 is now figure 10.*

Comment: Lines 355 to Lines368 Suggest this is deleted not necessary for a temperature data descriptor paper. Starting 'to create….considered suitable for '

Answer: *This part of the text (lines 355-369)has been moved to Supplementary materials Section II.*

Comment: Start at line 388, We visually compared adjacent…. I disagree that there is 'generally good correspondence'. Indeed the adrifoos data shows that the model is far to smooth and is missing the vertical structure, that's why this program is important… If the model were perfect you wouldn't need this data. This is clarified in lines 375 , but don't

Answer: *Thank you very much for this observation, in fact here we have underestimated the potential of our dataset; text has been changed accordingly.*

Comment: Lines 394-407 Not necessary as you don't include fishing data. I suggest you condense this section to 1 sentence describing future opportunities. Similarly delete Figure 15.

Answer: *Thanks for the suggestions, this part has been edited following this comment and those of reviewer 2; Figure 15 was eliminated.*

Figures

Comment: Figure 1: Replace 'up-right rectangle' with 'top right inset'. Are the red dots the positions of ALL the data? If so, say this. It would be helpful to put the section from Figure 13 on Figure 1.

Answer:*Thanks for the suggestions, the caption and the figure have been modified accordingly.*

Comment: Figure 2: It would be helpful to expand the figure caption to show what the logos all mean etc.

Answer: *Figure 2 has been modified following reviewers' comments; some logos in the figure were eliminated as deemed not necessary.*

Comment: Figure 3: pls spell out NKE or add 'temperature and pressure' sensors. What is the yellow? Are they in the plastic housing ? if so, state.

Answer:*NKE cannot be spelled out as it is the name of the manufacturing company but the reference to the sensors cited in the text has been added together with explanation of the yellow rubber protections.*

Comment: Figure 4: The screen shots are interesting, but they are too small to read, should probably be in English for this journal. You can add detail to the caption to describe what each one shows. What are the different coloured bars and lines? Describe the figure in the caption.

Answer: *Figure 4 has been modified in order to make it more readable and there are only two panels left, the catch summary panel (formerly panel b) has been eliminated as well as Fig. 15; the caption has been modified to better explain the figure by including some relevant Italian terms.*

Comment: Figures 5 and 6 are interesting from a program point of view but how does it help use or reuse the data?

Answer:*Due to the complex structure of the entire dataset collected, these figures are intended to help understand how the row dataset is stored and then the data are partly validated directly through the system; however these figure have now been moved to the supplementary materials becoming S1 and S2A,B (the latter has also been modified following other reviewers' comments).*

Comment: Figure 7b, Typo in Temperature units.

Answer:*Thanks and sorry for this and other typos throughout the text; Figure 7b is now Figure 5b.*

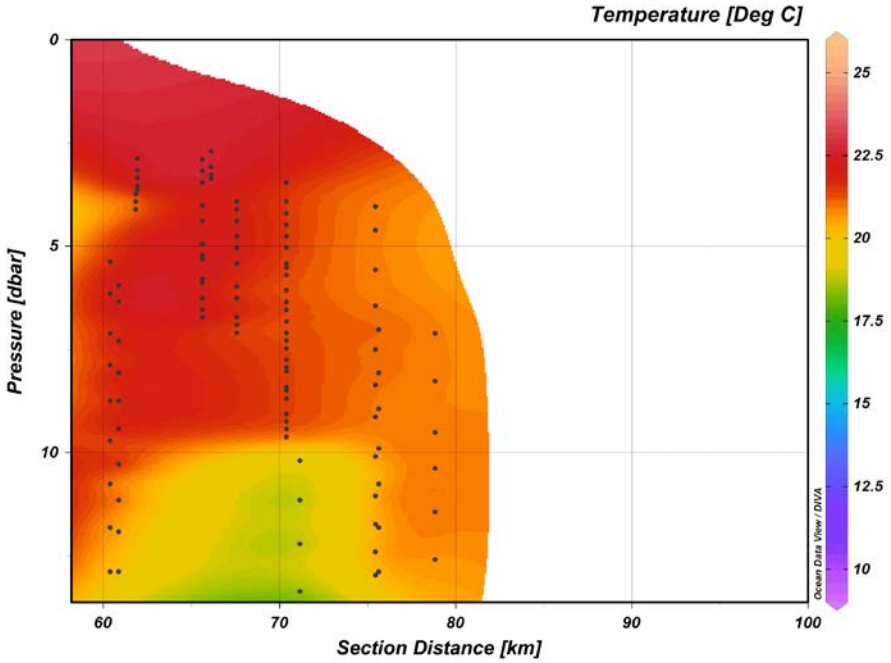
Comment: Figures 8, 9, 10,11 are nice they are a great visualisation of the dataset presented.

Answer:*Thanks a lot for the comment, we appreciate it; however, following a comment from the other reviewer, the latter two have been merged; now these figures have become figs. 6, 7, 8.*

Comment: Figure 13: What is 'an evidenced sea section' ?

It would be better to put all the sections on the same x-axis, starting at zero so they can be aligned. It would be better if they were also on the same colour bar range for easy comparison. At the very least, please write in the caption that the colour bar is different for each panel. The data at the surface on panel d at 65 km looks strange. Is this a spike that has been missed in QC?

Answer: *Thanks for the meaningful suggestions, the figure has been modified (now Figure 13 has become Figure 10) and now all the x-axis are aligned, starting from zero to 100km, and the colour bar range is fixed for all sections, spanning from 9 to 26 °C. The surface data on the d-panel at 65km does not show a spike; it looks like a graphical artifact generated by the ODV diva gridding, perhaps due to the different distribution of the vertical points (find below a zoom of the graph area).*



Comment: I note that you mention best practice procedures to be used while approaching this matter (Martinelli et al., 2016; Möller et al., 2019) – but what do these best practices describe?

Answer: *Examples of what is intended for best practices have been added at line 47: "e.g. define optimal operational conditions for each type of sensor to be used, test each sensor for offsets under traditional oceanographic operational conditions before field use on fishing gear, etc; see Martinelli et al., 2016; Möller et al., 2019).*

Comment: Figure 15

Not necessary for describing temperature data. You don't share the fisheries data, so save this figure for a different paper.

Answer: *Thanks for the hint, Figure 15 has been deleted.*

Acknowledgements

Comment: In my country it would be considered polite to acknowledge all the fishers and the vessels that participate in the program, you might like to consider the same.

Answer: *Thanks for the hint, acknowledgement to the fishing crews has been added.*

Review of 'Dataset of Depth/Temperature profiles obtained in the period 2012-2020 using commercial fishing vessels of the AdriFOOS fleet in the Adriatic Sea (Mediterranean Sea)' by Penna et al.

Responses to detailed comments of Anonymous Referee #2

General Comment: Paragraph 4 is very important but needs to be rewritten because it seems to be divided into two specular parts which confuse the reader a bit. It is necessary to describe how the sensors are calibrated instead of just putting "see Martinelli et al., 2016".

Answer #2: *we would like to respond again to this comment to explain that section 4 has been heavily revised following this and other comments by both reviewers; indeed we now tried to better specify all the steps used for QC and, in the aim to be as clear as possible, created new had hoc sections in the text: 4.1 Field test of sensors and evaluation of the offset, 4.2 Quality flags in use, 4.3 Automatic validation procedures, 4.4 Visual inspections, 4.5 Other quality check procedures featured in AdriFOOS. We hope that now the text is less confusing.*

Comment line 58: you mentioned that some data are shared in open repositories. I would suggest to put a table here with a list of data and addresses or DOIs.

Answer: *Thanks to this suggestion the text has been changed, please also find the related answer to one of the main comments above.*

Comment: line 68: change model in models
Comment: line 70: "is to" duplicated in the sentence
Comment: line 79: change "shallower" in "shallowest"
Comment: line 83: change Bora and Scirocco in the "NE-ENE Bora and the SE Sirocco"

Answer: *Thanks for the suggestions above, the text has been changed accordingly.*

Comment: line 84: change in "…2001)."

Answer: *Thanks for the suggestion, the text has been edited accordingly.*

Comment: line 157: here you write "in situ wind speed and direction (real and apparent),". Please explain how you correct these data from vessels' speed and heading

Answer: *Thanks for the comment , we added the following detail: "automatically calculated in real time by the device"*

Comment: lines 212-215: Figure 6 is huge and composed by three smaller figures that, in some parts, are difficult to read. If possible, I would suggest to choose one of them having the possibility to increase it in size and its readability

Answer: *Following reviewers' comments this section was moved to supplementary materials and this figure (now Fig. S2A-B) was modified, now consisting of only 2 panels.*

Comment: line 220: change "tested" in "calibrated"

Answer: *Actually, Martinelli et al. (2016) does not describe a traditional calibration procedure but rather a field test procedure, this has now been specified in the text in the new section "4.1 Field test of sensors and evaluation of the offset"*

Comment: line 220: put the data of the reference Martinelli et al. within brackets (2020)

Answer: *Thanks for the hint, we have added brackets to the year of the reference.*

Comment: line 226: please specify/describe the "specific software" here mentioned. Commercial or created ad hoc?

Answer: *Thanks for the comment, we have now specified this in the text.*

Comment: lines 233-235: please check if it is necessary to move all or some of these lines at the beginning of the paragraph. In this position it looks like a re-start of the description of data, in my opinion

Answer: *Thanks for the suggestion, actually this sentence was meant to explain that the data in Penna et al. (2020) are only those acquired along the descending phase, while the software is able to mark 3 different acquisition phases, we hope that now this is more clear in the text.*

Comment: lines 252-253: I think that the sentence "…are evidently still invalid and consequently flagged as incorrect" is linked with the red profile in figure 7b. If correct, please specify it.
Can you check the temperature unit in Figure 7b, please?

Answer: *Thanks for the comments; the invalid profile in red has now been specified in the text and the typo in Figure 7b (now Figure 5b) caption has been fixed.*

Comment: lines 260-264: these 5 lines should be deleted because no information is given on the subject of the paper (temperature and pressure data). If I am wrong than authors should rewrite them highlighting how they are linked with temperature and pressure data

Answer: *Thanks for the comment, this information probably wasn't relevant here, but following another of your comments we've moved it to section 3.1 where it's probably more needed.*

Comment: lines 277-278: the sentence "This software is freely available for non-commercial, non-military research and teaching purposes." must be deleted. All ODV users know this sentence from the website and its manual. The reference is enough.

Answer: *Thanks for the comment, the sentence in question has been deleted.*

Comment: lines 303-306: please rewrite sentences but delete Figures 10 and 11 that are not necessary. In this way authors can give more information and keep the attention of the reader. These two short sentences and the following figures make the part less readable

Answer: *Thanks for the comment, in the aim to make the text more readable Figure 10 and 11 have been merged (now becoming Figure 8) and the relative descriptions have been synthetized.*

Comment: lines 327-344: please delete or synthetize but eliminating the mentioned figures. Here authors just put captions in the text then passing from a figure to the following then greatly weighing the discussion down, a very important paragraph in the whole paper.

Answer: *Thanks for the comment, but we cannot delete at this stage the figures (now Figures 9 and 10) as these have been taken into consideration by reviewer one, so we tried to make the text a bit easier to read.*

Comment: line 353: please re-write the sentence not starting with "Figure 14 shows…" but "A comparison…."

Answer: *Thanks for the suggestion, the text has been changed accordingly; Figure 14 is now Figure 11.*

Comment: lines 355-364: delete this part. This is a discussion and conclusion that should summarize the whole paper based on temperature and pressure data collected in a dataset, that authors have described. If authors want to keep it, than a new paragraph should be created before this one keeping in mind the aim of the paper.
Comment: lines 364-376: please synthetize these sentences

Answer: *This part of the text (lines 355-369) has been moved to Supplementary materials Section II.*

Comment: Figure 14: please increase the thickness of the lines in the plot from 14a to 14 c and the size of the graph labels in all plots. Otherwise once published they will be unreadable.

Answer: *Thanks for the suggestion, the figures have been modified and we hope now are more readable; Figure 14 is now Figure 11.*

Comment: lines 394-397: please delete the sentence till "engrausicolus)." and the corresponding Figure 15
Comment: lines 398-400: please delete from "in fact…" to "…Furthermore"

Answer: *Thanks for the meaningful comments above, the text has been changed accordingly and Figure 15 has been deleted.*