Review 1

>>>I thank the reviewer for the time to comment and help improving the manuscript. Replies are behind>>>

This manuscript described a focused consideration of small-scale variability of temperature structure in a focused volume of water deep in the Mediterranean Sea. In many ways it took me back to the discovery age of ocean turbulence with some intensive sampling using a novel labor-intensive approach, operating at the limit of what is possible, trying to describe a complex set of processes happening at the small scale and seeking a way to relate to the bigger picture. In that sense I found it a valuable contribution. However, I also thought some of the potential impact was lost through unfocused development of the story and lack of clarity around "turbulence".
>>>Thank you for the appreciation. Following implementation of the comments by the reviewer I assume the story has been clarified.

I have provided a marked version of the manuscript.
>>>Replies are given to each of the comments in the marked version of the manuscript.

My main areas of uncertainty relate to:

Clarity in turbulence estimation both in language and presentation. Certainly, the approaches are established (and not without their limitations) though their usage here is somewhat non-standard and so needs a clearer presentation. Indeed, one could imagine a version of the manuscript that focused on this. I think only a very well-schooled turbulence person could immediately make way through the present flow of ideas.
>>>The comments in the marked version of the manuscripts have been carefully considered and are used for guidance to make the manuscript clearer.

The connection to the larger scale is of course ultimately where this type of work needs to go. The connection to the outer data of wind & surface temperatures seems to go in reverse – we start with the turbulence and then work our way out? If this were reversed I think there'd be a clearer picture of what mechanics would be acting? So a downscaling rather than an upscaling from the 2.5 km deep patch of turbulence data?
>>>To a certain extent yes, for the slantwise downward convection turbulence meteorological data are relevant. These data are not relevant for the geothermal convection from below. This is better indicated now, with the notion that we are analysing detailed measurements from the deep sea in this work.

The flow and clarity of the text in critical places could have some extra work – eg abstract and opening paragraph.
>>>This has been improved now following the comments in the marked version of the manuscript.

I really would have liked to see a sketch with both large and small scale perspectives on the setting and energy flows?

>>>An attempt for such a sketch has been introduced now, as (new) Fig. 9.

Review 2

>>>I thank the reviewer for the time to comment and help improving the manuscript. Replies are behind>>>

Overall this is a very interesting manuscript using a unique data set to make inferences about the turbulent characteristics of the deep Mediterranean. The data set is genuinely unique and provides a view we have not previously had on these processes. I congratulate the author and engineering / technical team on successfully pushing the observational tools we have truly to their limit. The analysis presented is detailed and provides a nice description of the complex small scale structure and processes present in the data set. At times the message of the paper becomes lost amongst this detail and I would suggest to the author that they revise the paper to lead the reader through the detailed analysis more. For example, closing the introduction with some explicit signposting of the analysis that is to come in the paper and then including a sentence or two at the start / end of sections to highlight how they fit into the bigger picture of the paper. I would also recommend reducing the use of acronyms as I found they broke the flow of the paper as I had to remind myself of some of their definitions.
>>>Thank you very much for the appreciation. The manuscript has been carefully reread and modified following the suggestions above. Text has been inserted at the end of the Introduction and some other places, while sub-sections have been introduced for better readability. Acronyms like GH, DWF, IGW and CM have now been spelled out, but those used 30+ times (combining pass-filters) are left, like CTD which is a common oceanographic instrument.

Minor Comments

36 – 39 – Not clear what “one-four days” is referring to
>>>This sentence has been removed now following a comment b reviewer 1.

46 – 50 – I feel these two statements ought to have references to support them
>>>References have been inserted now.

69 – 70 – This sentence seems to be unnecessarily vague. Why not just say salinity?
>>>OK: the other …variations salinity

76 – 78 – Punctuation is wrong and made the sentence hard to read. Should be “A combination of irreversible and reversible processes was observed in fresh-water alpine Lake Garda where, in the weakly stratified waters underneath internal waves, convection turbulence was observed (van Haren and Dijkstra, 2021).”
>>>Thank you for pointing out. Modified now, in a similar reworded sentence.

93 – I think the full stop is in the wrong place
>>>Sentence slightly modified to improve readability.

97 – 99 – The two halves of this sentence seem unrelated to me.
>>>Perhaps not r=directly related, but these constitute two characterizations of these motions. The sentence is split in two now, and reversed in order.

153 onwards – Whilst this is a very dense mooring data set, there should be a mention of the vertical resolution limitations in the context of Thorpe scales and perhaps an estimate of what is being missed due to the resolution.
>>>The following sentences have been added after '…inertial frequency.': As the method by Thorpe (1977) is typically applied to profiling data, the vertical spacing of 2 m of moored T-sensors is sufficient to resolve Ozmidov (1965) and largest overturning scales, as has been verified in (van Haren and Gostiaux, 2012). The transition to the energetic turbulence regime occurs for scales > 1.8 m under N = f using the buoyancy Reynolds number threshold in (Gargett et al., 1984).'

193 – Typo "ssix"
>>>Thank you for pointing out.

255 – This section contains no reference to Fig. 5 but I believe draws from it. Figure 5 currently isn't explicitly referenced in the text.
>>>Fig. 5 has been referenced as the split between the first and second lines of this section (after '320.5').

248 onwards – How have the averages dealt with the areas where no overturns are detected / they are too small for the data used here? If it isn't accounted for does this bias the statistics?
>>>As given in the text now: There is some bias to low mean turbulence values by disregarding overturns below threshold, which is very low given the <0.0001°C precision of T-sensors after post-processing (van Haren, 2018). However, this bias is well within the error of calculation as turbulence is dominated by the large energy-containing overturns.

314 – 315 – I am not sure what this means
>>>Fig. 7, and …breaking. → Fig. 7. The associated 3.5-times larger turbulence dissipation rates (5) compared to GH-value (3) are mainly generated by convection in conjunction with shear following internal wave breaking.

Fig1a – There are many labels in this map that are too small to read. There are also various yellow lines that are not mentioned in the caption.
>>>The small labelling at the ORCA and ANTARES sites are not relevant and these have been removed now. The various lines appear lines in the pdf, but are grey in the original. These designate harbour approach sectors, as mentioned now.

Fig2d – The colours of the different lines are not defined anywhere.
>>>Defined in the caption now.