

Response to Referee 1 (Mike Bell)'s Comments on the Revised Manuscript

We have responded to each comment below. The Reviewer's comments are in **black text** and our responses are in **blue text**.

The authors have given clear responses to nearly all my comments and modified their paper accordingly. I recommend that the paper is accepted subject to one revision and two minor suggestions that the authors can accept or reject as they see fit.

I note that I found it quite difficult to check the changes made in response to my comments because the authors did not give me the lines in the new version of the paper corresponding to the comments. Also I didn't see a list of the changes that have been made to the paper despite the fact that some of the changes (for example to the results in section 4.1) are quite substantial.

We thought that it would be sufficient to describe the changes in the responses and highlight them in the text. However, we agree that because there have been extensive revisions we should really have included the line numbers of the changes from the revised version. To simplify the presentation we highlighted all changes made as direct responses to referee comments (consistent with the style guidelines to highlight "relevant" changes).

Requested revision

Lines 525-527. The first sentence summarising the results for the sea mount test case has not been revised in line with the changes to the results. This sentence should be revised. The "note of caution" that has been added in the following sentence is not a sufficient qualification. The earlier text is quite clear that the present hpg scheme needs to be improved (lines 419-420).

Thanks for catching this: we missed updating this sentence in the conclusions and have now modified it at lines 527 to 531 (track changes copy) to properly reflect the new results.

Suggestions for Minor revisions

1. Sentence following (7)-(9): The authors note in their responses that the along-layer diffusion would be zero for the case of a linear EOS. I had not realised this and think that it would be worth pointing it out explicitly. I think it relies on the layers being initialised with uniform potential temperatures and retaining those values.

As we stated in our response, in the current WAVETRISK implementation it is diffusion *along an isopycnal* that is exactly zero and therefore does not make sense (in the case of a single scalar and linear EOS). The implemented along-layer diffusion is indeed non-zero for inhomogeneous density layers.

2. Lines 264 and 271: The authors moved a sentence to line 264 following my comment. I actually meant to suggest that the sentence now on line 271 (starting "Since it uses ...") be moved to line 264 (after " $\tau \approx 1 \mu\text{s}$ ")!

Thank you for the clarification: we have now modified the text at lines 264 to 273 (track changes copy) as you had originally intended.