

Response to Reviewer #2

Referee comment on "Global submesoscale diagnosis using alongtrack satellite altimetry" by Oscar Vergara et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-1073-RC1>, 2022

Major comments

1. It has been shown that SSH and its spectrum have a clear seasonality. It is worth a separate section to look into the same set of diagnoses but considering their seasonality, i.e., of the submesoscale signals as well as the transition scales and spectral slopes.

Response: Following the suggestion by the reviewer we decided to add a section documenting the seasonal variability observed in the meso- and small-scale spectral slopes as well as Lt. However, the robustness of the seasonal results is heavily conditioned by the time series length, the observability and uncertainty criteria (same criteria used to report the average results presented in the previous version of the paper). With three years' worth of data, the seasonal averages are performed over a period equivalent to 9 months (3-month average for every season). As a result, we do not observe a global coverage of significant seasonal differences (at 95% confidence). We decided nevertheless to include the seasonal Lt results in the discussion section (Section 4.3) and the spectral slopes as supplementary material (Appendix B).

Minor comments

1. Line 217: "the local observability wavelength is low" can be reworded to "the local observable wavelength is short".

R: The sentence was rearranged.

2. Line 141: change "the regionally average" to "the regionally-averaged".

R: The misspell error was corrected.

3. Line 143: do you mean "spectral slope variation" by "spectral variance"?

R: The sentence was modified for clarity.

4. Line 145: provide an quantitative description of "changes abruptly"

R: The sentence was modified for clarity.

5. Line 153: define "x"

R: The sentence was modified.

6. Line 154: add "in the log-log coordinate" after "two straight lines"

R: The sentence was modified.

7. Line 160: by “coherent”, did you mean “consistent”?

R: We meant “continuous”, as in a continuous function. Applying a simultaneous fit assures a continuity of the model used to reproduce the observations, as opposed to successive individual fits where the sum of the models would not reproduce the observations as each individual model is minimized over a certain wavelength range. The sentence was modified to reflect this reasoning.

8. Line 161: replace “average regional” with “regionally-averaged”

R: The sentence was modified.

9. Line 170: “least-squares” should be “least-square”

R: The sentence was modified.

10. Line 217: replace “short” with “small” as it describes wavelength

R: The sentence was modified.

11. Line 201: delete “values”

R: The sentence was corrected.

12. Line 339: Did you mean “significant”?

R: The misspell error was corrected.

13. Line 435: replace “lowest” with “shortest”

R: The sentence was modified.

14. Line 543: change “of critical importance” to “critical”

R: The sentence was modified.