Point-by-point reply to Topic Editor

C1: Thank-you for your reply to reviewers. I think you have addressed their points sufficiently on the whole. I just have a couple more comments before it goes for typesetting.

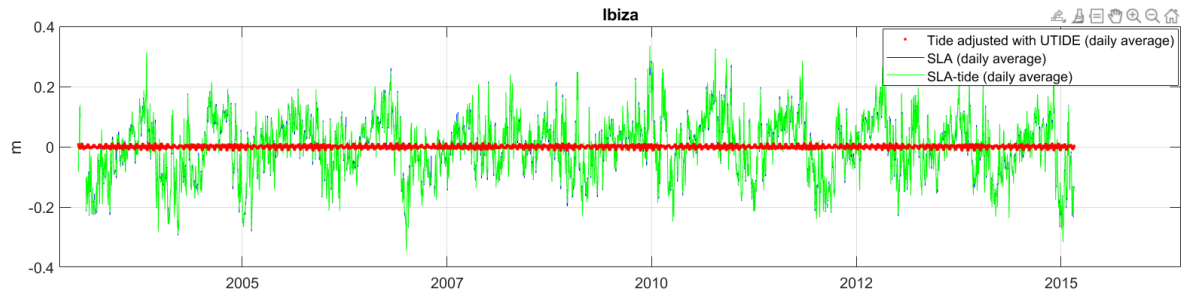
R1: We would like to thank you again for handling our manuscript. The answers to your comments are given in the following, and the corresponding changes have been implemented in the new version of the manuscript, which we believe has been improved.

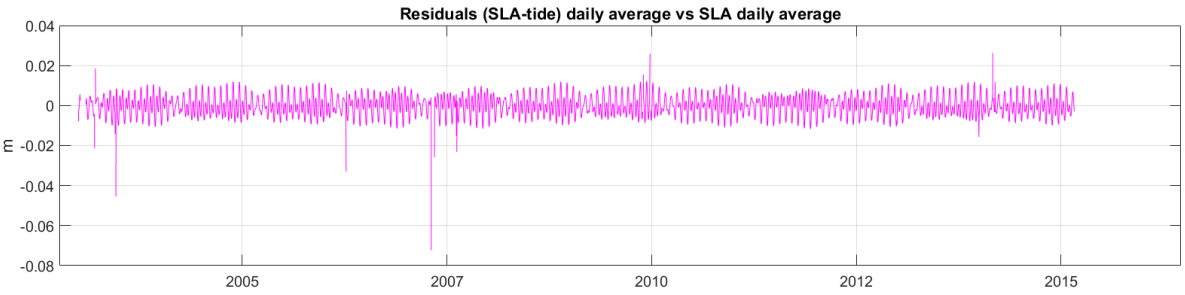
C2: One reviewer asked [comment C3] about controlling for the tide in your analysis, and I don't think you've answered this sufficiently. Daily means may not be sufficient to remove the tidal signal, and it is standard practice to use a filter such as Doodson or Demerliac as well as applying means. You need to justify this more carefully. (I suspect it's OK in the Mediterranean because of the small tidal range compared to other variability, but would not be applicable if your technique were applied in other areas. So please check the size of the remaining tidal signal).

R2: We would like to clarify that removing the astronomical tide was not our objective. The separation of the sea level anomaly series was carried out by frequency bands, not by physical processes. If we wanted to remove the tides, we would have done it using other methods, as we agree that a daily averaging of time series is not sufficiently accurate.

The aim of the separation in frequency bands was because spatial correlations usually depend on time frequencies, and therefore the interpolation carried out for each separate band is expected to be more accurate than carrying out the interpolation for the whole field.

In any case, the editor is right in that for the Mediterranean tidal range a daily average removes most of the tidal signal. In order to illustrate this, we show some computations carried out for the Ibiza tide gauge record. The RMS difference between daily averaging the original series and daily averaging the de-tided series is of the order of 0.5 cm. The tidal signal was adjusted from the original hourly series of the Ibiza tide gauge, using the UTIDE matlab toolbox (https://es.mathworks.com/matlabcentral/fileexchange/46523-utide-unified-tidal-analysis-and-prediction-functions).

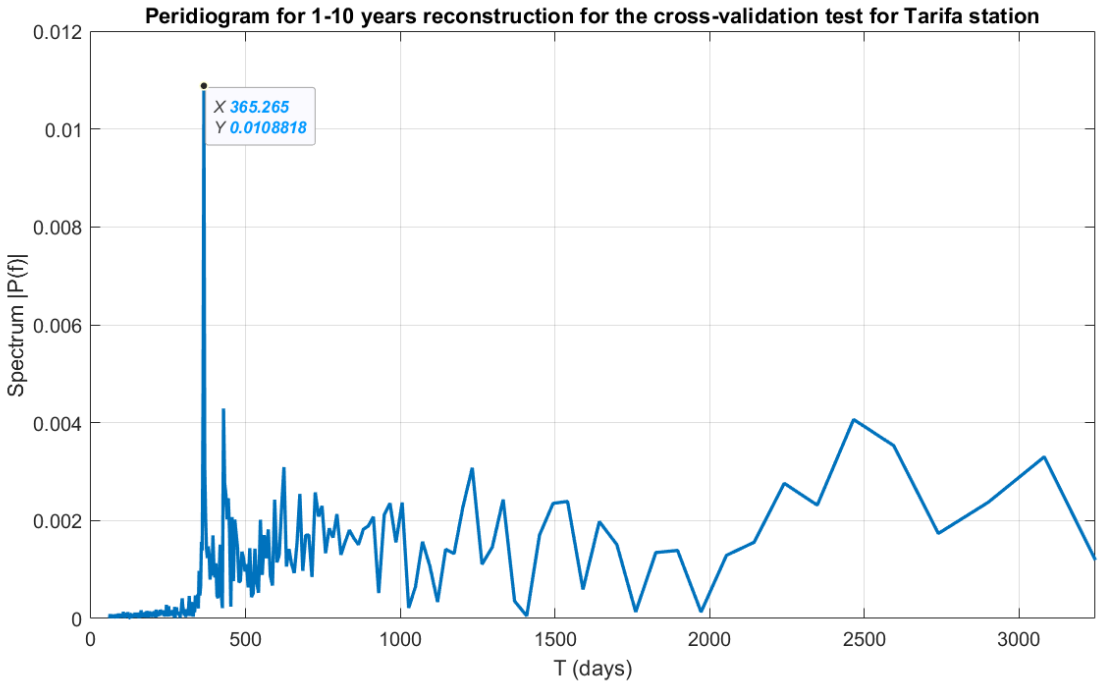




Because tides are not mentioned at all in the manuscript, we would prefer to leave as it is now, in order to make it as simple as possible.

C3: Fig 5 annual signal in 1-10yr?

R3: Yes, this band shows a clear annual component, quantified in the periodogram showed in the following. The periodogram has been obtained applying a fast Fourier transform to the reconstructed series of the cross-validation test at the closest point to Tarifa tide gauge. The peak corresponds to the annual component of the seasonal cycle of sea level, which lies on the boundary between this band and the band of periods between 1 month and 1 year, and must necessarily fall in one of the two. The use of a Butterworth filter of order 10 aims to achieve an attenuation that is abrupt at the cut-off frequencies, in order to achieve a proper separation between the bands.



C4: Line 176 surely just "the trace of matrix []"

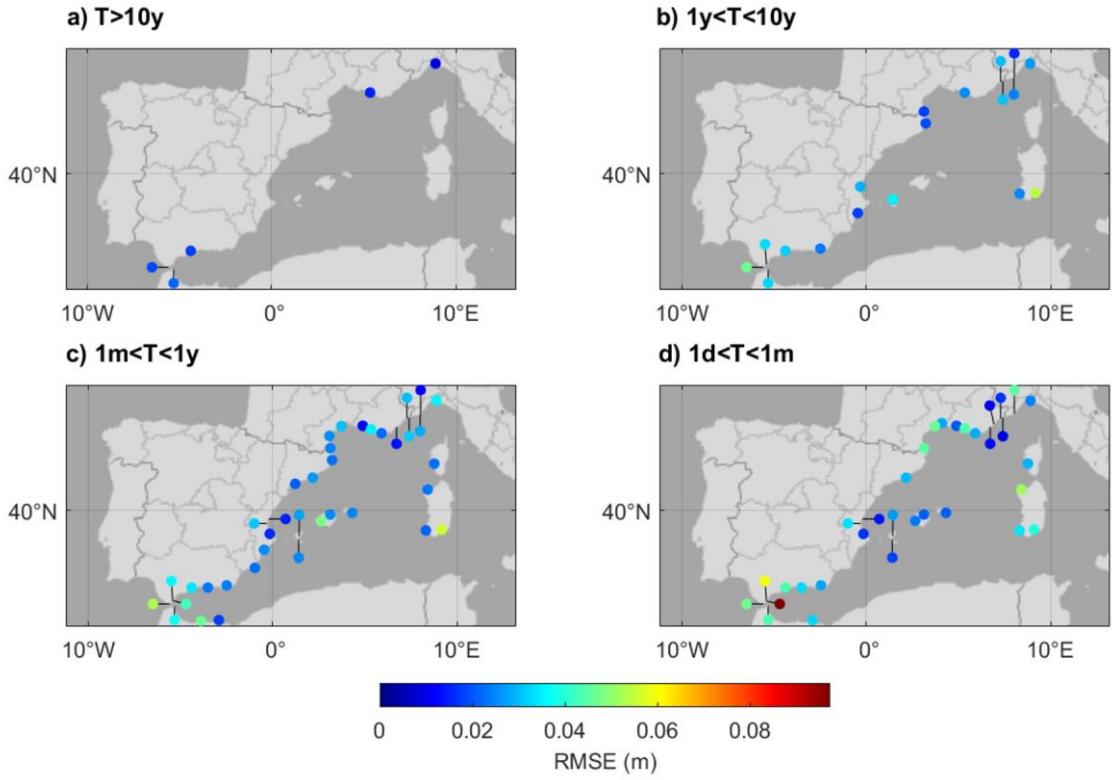
R4: Sorry, this was a mistake, indeed, but not the one pointed out by the editor. We intended to refer to the g-element of the **diagonal** (not the trace) of matrix [•]. Besides, there was another mistake, this one in formula (4): if matrix θ is defined as in (2), then the matrix appearing in (4) must be $[\theta\,\mathbb{T}^{-1}\theta^{T}]$ instead of $[\theta^{T}\mathbb{T}^{-1}\theta]$. In summary, lines 175-177 should read:

$$\varepsilon_g = \sigma_g\,(1 - Diag_g[\theta\,\mathbb{T}^{-1}\theta^{T}]) \qquad (4)$$

where σ_g is the variance of the signal at point g, and $Diag_g[\bullet]$ denotes the element of the diagonal of matrix $[\bullet]$ corresponding to the interpolation point g.

C5: Figure 2: Using a scatterplot has the disadvantage that certain spots obscure others. It is particularly a problem in the Gibraltor area in panel d, where there is a big difference between neighbouring points and one is hard to see. You need to find a way of plotting this to avoid this problem. It might be better if you sort the sites along the coast or by longitude before plotting, but maybe just a larger plot will work.

R5: We agree that the overlapping between spots makes it difficult to visualise the results. We consider that the best alternative is to move the overlapping spots, linking them with arrows to their location. This is how figure 2 would look like after applying this solution to the Strait of Gibraltar, the French blue coast, the pair Valencia-Sagunto and the pair Ibiza-Formentera. In the new version of the manuscript this way of representing the dots is also used in figures 3, 4 and 12.



C6: Figures in the Appendix - ideally, these would be sorted by location along the coast rather than alphabetically, so we can see any patterns that emerge. But consider this optional.

R6: Thanks for the suggestion, we have ordered the stations along the coastline in figures A1, A2 and A3.

List of relevant changes in the manuscript

- In table 2, some dates in dd/mm/yyyy format have been changed to yyyy-mm-dd format. In particular, the initial dates of the tide gauges at Cagliari, Genoa, Marseille and Porto Maurizio.
- Equation 4 has been corrected, and it has been clarified that this equation refers to the g-element of the diagonal (not the trace) of the matrix.
- Figures 2, 3, 4 and 12 have been modified, separating those points that overlapped with each other and linking them with arrows to their location, in order to facilitate the visualisation of the results.
- In figures A1, A2 and A3 the stations have been rearranged along the coastline. In addition, the names of some stations have been corrected so that now they appear with the same name than in tables 1 and 2.