# Smoothing and Interpolating Noisy GPS Data with Smoothing Splines—Reviewer Response #2

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## 1 Reviewer 3

The authors provided a detailed response to my comments and to those of the other reviewers. I appreciate the inclusion of a new section discussing how the proposed methods compare with other techniques, and the author's efforts to shorten the manuscript. I maintain my position that this paper will be of interest for JTECH readers as it provides a practical method for processing drifter data, although I also think that some passages of this new version of the manuscript can be reworded to improve clarity. My comments correspond to a Minor Revision. Please find them below.

Once again we very much appreciate the time you have invested to review the manuscript. Thank you.

Equation (9): Please explicitly define the variable $\omega$ (frequency) in the text immediately following the equation;

Fixed.

Lines 136-138: The paragraph still does not mention how the synthetic velocity signals used in the analysis can be obtained from Equation (9). I requested including this explanation in my previous revision, to which the authors responded that it is already provided in Lilly et al. (2017). However, that is a rather long and technical work, reason for which I think that it would be a good idea to avoid making the reader go through the Lilly et al. (2017) paper by briefly describing this relevant step of the analysis in the text;

Thank you for the nudge. We should have pointed directly to the code where this is available. We have now added the sentence: Trajectories from this velocity spectrum will be generated using the `maternoise` function in available in `jLab` (Lilly 2019). This points the reader to a very accessible way of generating their own velocity data, without adding significantly to the length of the manuscript.

Line 310: Please define the acronym "mse" (used later in the paragraph) after "mean square error";

Fixed.

Line 315: Please rewrite as "This means that, when handling large datasets, we can ...";

Fixed.

Lines 352-363: The definition of "blind" and "unblind" methods is scattered throughout the paragraph. Specifically, the reader is presented to the meaning of "unblinded" estimates in line 355, while the next sentence (line 358) mentions "blind" methods without explicitly defining them (its meaning is provided in the following sentence). Please rephrase this paragraph to improve clarity. I suggest explicitly defining what is meant by "blind" and "unblind"methods in the beginning of the paragraph after presenting Table 2;

We added the sentence: When the algorithm uses true values, uncontaminated by noise, we considered the process 'unblinded', in contrast to 'blind' methods, where the algorithm only uses noisy data.

Equations in Section 8 are referenced without parentheses, i.e. Eq. 8 instead of Eq. (8). Please correct all occurrences of this issue;

Fixed.

Section 8: I think that the discussion could use a punch phrase, summarizing why/when the proposed methods are preferable to the other mentioned techniques.

Thank you for this suggestion, indeed it did end a bit abruptly before. We have now added the sentence: Overall, the methodology of this paper (in a loose sense) generalises a number of existing approaches for interpolation, especially in terms of flexibly allowing different levels of smoothness and tension, and application to non-Gaussian noise structures.