Review of the article:

Computational Efficiency for the Surface Renewal Method

by Jason Kelley and Chad Higgins

GENERAL COMMENTS:

The article is well into scope of the AMT journal and I support its publication after the corrections suggested below. It describes useful toolbox as a new idea for the surface renewal method and the effort to make it more computationally efficient is important for micrometeorological community. The writing should be improved for the sake of clarity. The title should be changed to reflect the manuscripts idea of improving the initial part of the surface renewal method – the ramp detection method. It should be clarified further in the manuscript that the fluxes will be final once the Two-Scale Scalar Ramps method (Shapland et al., 2012a; 2012b) is used or appropriate calibration approach is implemented (i.e. different works by Snyder and/or Castellví). These articles should be referenced correspondingly. The Conclusions section should be rewritten completely. The content is more appropriate for the introduction section and lacks to show direct conclusions of the manuscript's purpose.

SPECIFIC COMMENTS:

P1L9: "20 Hz+" I suggest changing to "10+ Hz" since there are articles published on successful SR application over data collected at 10 Hz frequency. Similarly, it is mentioned 10+ Hz in the introduction section.

P1L13: Please add, "computational" before the word "efficiency"

P1L14: Please, be more specific, i.e. avoid saying "Programming techniques such as these", it is still not clear in the abstract what you are referring to. Also, "can grant" is not suitable to the rest of the sentence, since what you are stating is not the subject of your research presented in this manuscript, but just a suggestion. Try using "may be useful" or similar instead.

P1L19: Please add word "possible" between "determinations" and "using".

P2L50: Please clarify. It is said in this line that the convolution is used for structure functions computation, while later is said the convolution is used to despike the data. It seems that the convolution is used for both and should be explained.

P2L51: Replace "simplifying" with "to simplify"

P2L53: Please, start the Methods differently, i.e. avoid saying "These algorithms" since the algorithms are not very well defined so far in the manuscript and it is always better for the reader to be more specific.

P2L59: Add, "the method" before "implementation"

P4L105: Please change the word "approach" to "program" or "program run" for clarity.

P4L111-113: Please rewrite for the clarity.

P4L114: Please replace "identical" by "from the same 20 Hz dataset".

P4L131 and L133: Should "N-1" be actually "N-r"?

P4L133: Should "T(t)" be "T(i)" in accordance to Eq.1. and for clarity?

P5L137: "sweeps and ejections" of what? It should be clarified adding more description of the surface renewal method background.

P5L138: Please add "ramps in the temperature signal caused by" between "geometry of" and "coherent structures"

P5L140 and L141: Please change to be clearer that the detection of the structure functions in the scalar signals improved.

P5L144: Explain under which conditions.

P5L146: Please replace "to" by "for" if I understand well. In addition, explain why are the periods of 8 hours collected, and not continuously for two months. What challenges did you find? Was it only data collection for the unstable conditions?

P5L147-L150: Please explain how this analysis is useful. Are fluxes better to be calculated for 3 minute periods?

P5L163: What "total data size" means? It works with the same efficiency over 20Hz and 100Hz dataset? Please clarify.

P5L169-170: Is this the result of the authors' own research? If not, please give a reference.

P6L174: "again the largest factor in the difference between two methods" is making this phrase unclear. Please change to clarify.

TECHNICAL CORRECTIONS:

P1L10: One extra space seems to be typed in between the words "demonstrate" and "that"

P1L26: I think "manifests" is necessary instead of "manifest"

P2L60: "on" instead of "one"

P3L95: "an" instead of "a" before "application"

P4L111: Please use different word instead of "conditioning" if possible (i.e. "despiking")

P4L135: Please replace "product of" instead "product by"?

P4L135: Please replace "sense" by "importance in the flux measurement" or similar. Also, replace "generate" by "are"

P5L158: Please replace "difference vectors" by "the vectors of the differences". In addition, change "for each sample lag" by "for the corresponding sample lag"

P5L165 and 166: are empty.

Avoid "@" in Figure titles.