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Interactive comment on “Validation of the k -filtering technique for a signal composed of random phase plane waves and non-random coherent structures” by O. W. Roberts et al.

O. W. Roberts et al.

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I thank the authors for their corrections. For me, the paper is now suitable for publication. A few corrections could however still be added, but I let to the authors the responsibility of doing them.

We thank the reviewer for his thorough reading of the manuscript and for several helpful comments which have resulted in a much improved manuscript compared to the one that was first submitted.

I mention here only three of them:

C237

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- In the definition of "coherent structure" that has been added, the reader is told about some characteristics of them, duration and spacing, that are related only to the word "structure", but there is no reference to the notion of "coherence", which is more intriguing. Instead of "intermittent magnetic field signature", one could say for instance:

We agree, and have applied the suggested changes. "a coherent wave packet, i.e. a coherent signal windowed by an envelope of limited extension". With, maybe the additional note: "two coherent structures are generally incoherent with each other".

- I think the paragraph about the "advection" of the structures is still misleading (and useless, in my opinion). First, the explanations only refer to Alfvén structures (when comparing the bulk velocity to the Alfvén speed and when evoking the Alfvén vortices). All existing fluctuations are not Alfvénic. Second, the explanations don't make any difference between the parallel and the perpendicular propagations, which should be important, in particular for Alfvénic fluctuations.

We approached this topic from the perspective of the solar wind where the bulk velocity is dominant. However we appreciate that in other plasma regions this may not be the case and the dominant motion may be along the local magnetic field. We have therefore changed the text to include the sentence:

"In other plasma environments such as the magnetosphere, bulk velocity is typically smaller than the solar wind. In this case we may expect that fluctuations have a significant component of the velocity to be along the direction of the magnetic field along in addition to the typical velocity due to the advection."

With regards to the differences between parallel and perpendicular fluctuations. These would be expected to have different phase speeds, which is an important issue with regards to spatial aliasing and has been discussed by Sahraoui et al. 2010 JGR. If the bulk velocity is especially small (smaller than the phase speed) k-filtering cannot be used since we are limited in frequency to: $\omega_{max} =$

$k_{max}(V_f - V_p)$. **In this paper we do not discuss limitations to aliasing since it is outside the scope of the paper.**

- The conclusions could be made clearer by adding a little word for linking the two parts of this conclusion, which can appear contradictory at first sight: 1) incoherence is required; 2) "Nevertheless", incoherence can result from a set of coherent structures.

We agree, and have applied the suggested changes.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 4, 435, 2014.

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