Final author comments on "Interpretation of Cluster WBD frequency conversion mode data" *by* J. S. Pickett et al.

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Response to Ondrej Santolik (Referee)

We thank Dr. Santolik for his thoughtful comments as a referee of our paper and address his suggested minor technical corrections below.

Response to Specific Comments:

1. page 556, lines 21-23: units "(a.u.)" for amplitudes are missing

Response: The units of "a.u." will be added in two places as suggested.

2. Caption of Fig 2: "January2010" -> missing space between January and 2010.

Response: The space will be added as suggested.

3. References: As in my Access Review I still suggest the authors and the Editor to consider including the report of Swanner et al., 2006 as supplementary material published with this paper (or to publish it as a separate paper), and ensure thus its future accessibility. Swanner et al., 2006 is an important reference for this paper and it is currently published on two data archiving websites (on the University of Iowa site and on the ESA CAA site). It would make more sense to me if it becomes a part of the public literature.

Response: As suggested, we will include the Swanner et al., 2006 report as supplementary material in the revision of this paper.

Response to Anonymous Referee #2

We thank the referee for his/her positive comments regarding our paper and for the suggestions to improve the paper. These suggestions were already incorporated in the paper published online for discussion. Below we provide the referee's comments followed by our responses. Our references to Page and Line numbers are given for the Discussion paper published online.

1. By considering the study result in this paper, we can infer some candidates of the original waveform from the down converted waveforms. However, it is very difficult to determine the unique waveform only by seeing the output waveform after the down conversion. The authors should stress this in the text. This is the limit of the waveform receiver using the down conversion.

Response: Your point is well taken. We added some sentences with regard to the receiver's limitations to the end of the abstract (P. 548, L. 25-26) and the end of the manuscript (P. 559, L. 25 through P. 560, L. 2).

2. The results shown in Figure 3 (a) and (b) show that a mono pulse appears after the down conversion of a wave packet consisting of several sinusoidal waves. The pulse width is almost equal to the envelope width of the wave packet. Then, the simulation in Figure 5(a) should use a wave packet as an original waveform. However, the authors setup the mono-pulse waveform before the down conversion. I don't understand the reason why the authors use the mono-pulse waveform instead of the wave packet in section 3.

Response: We have chosen to show the mono-pulse in Figure 5(a), as opposed to the wave packet, since it is the mono-pulse type of waveform that is seen most often in the WBD waveforms obtained without conversion and we expect this would be the case with conversion mode data even with the shorter time scales, which are consistent with electron associated processes. This explanation was added on P. 556, L. 24-28.

3. The paper is more important for scientists who are not so familiar with plasma wave receivers or data processing of plasma waves. Then I recommend to describe the frequency down conversion method more detailed by using some illustrations to help their understanding.

Response: We described the down conversion method in more detail on P. 549 L. 22 through P. 550, L. 2, and included a new figure (Figure1) to illustrate the method.

Minor point:

P10 line 14: Does AAR denote “Aurora acceleration region ?”

Response: It denotes Auroral Acceleration Region. It has been spelled out now, instead of using the acronym, on P. 559 L. 13.

Other Comments

Since first submitting this paper for review, certain details about the Cluster Active Archive (CAA) and Cluster Final Archive (CFA) were still unknown, which were referenced in our paper. Since then, we have been given these details, such as when the CAA would close and the CFA would open. The CAA will close in early 2014 and the CFA will be known officially as the Cluster Science Archive (CSA). Thus, the revision of our paper will include changes related to this, as well as the URL link to the CSA.