Earth Syst. Sci. Data Discuss., 3, C18–C25, 2010
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Earth System Science Data Discussions

Interactive comment on "Measuring hydrodynamics and sediment transport processes in the Dee estuary" *by* R. Bolaños and A. Souza

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Review of essdd-3-79-2010 : Measuring hydrodynamics and sediment transport processes in the Dee estuary R. Bolanos and A. Souza General comments The topic is interesting and the paper is well organized. Anyway I believe that few, minor, revisions should be considered before publishing the manuscript. Here follows my observations and suggestions to the authors:

About the figures Figure 1 Missing color scale legend, it should be [m]. Negative values in the colour bar should be explained since it is not of immediate understanding. AUTHORS: The colour legend has been included and the negative values explained.

Figure 3 I cannot see any change between original and despiked data after then ordinal

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Interactive Discussion

Discussion Paper

2000. The plot is not clear enough, you may consider to add a plot of differences between original and despiked data, also adding a panel to the figure. Explicit “Hs”. What exactly means : “Number of Data “ (X-axis label)? AUTHORS: The data represents an intruburst time series (20 minutes of continuous record with an sampling frequency of 8 Hz), we have changed the figure to add a difference time series between the original and despiked and change the x axis to show the time in seconds. The time series shows the magnitude of the mean current with the turbulence variations. ADV data can present some spikes (such as the one with velocities larger than 30 cm and lower than -30) and thus the method aims to remove such spikes without removing the turbulence information. The fact that not many changes are observed between original and despiked means that the data is clean. We have also change the figure caption to make it clearer.

Figure 4 The caption of this figure is not clear, please clarify. The figure might be subset in labeled panels and the caption should refers to the labels. i.e. : top panel : label :a etc.... In the caption : a) Time series of current velocity (flood : positive, ebb : negative), b) water depth, ... Another solution is to color (reb/blu) the line which represent the time series. Also you may add vertical grid lines. AUTHORS: The figure caption has been corrected to be clearer.

Figure 5 You should inform the reader explicitly about the vertical axis meaning. Also you should add minor ticks to the horizontal axis, i.e. each 25 units AUTHORS: The figure has been improved

Figure 6 Salinity and Temperature profiles are so similar !? The figure is hardly readable, you should find another way to represent these data, perhaps with a multiple panel figure grouping flood/ebb events, so the comparison might be easier. Also T/S plots might be added. AUTHORS: Regarding figure 7 (the reviewer named it as figure 6), it shows clearly the time evolution of the profiles, at the start of the flood (just after low slack water) the water column is stratified, but as the flood starts to progress the water column mixes, and with the ebb tides the water stratifies again. By looking at the

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changes in temperature and salinity it can be seen that the density is mainly controlled by salinity. We have explained this more clearly in the text and modified the figure.

About data availability The author should give details about data access at BODC and data policy. AUTHORS: This has been included in the new version of the paper.

About the manuscript Section 1, row 25-29 (pag 81) The sentence “The Dee is a macrotidal estuary characterized by the presence of waves at its outer margins, strong tidal flows in its channels, and a mixed seabed usually muddy sands or sandy muds. The overall transport direction, in or out of the main outer channels of the estuary, is probably grain-size dependent” reports data and consideration on the Dee estuary. To my opinion you should add citation(s) about the Dee estuary, so the reader might want to know more about the environment where data has been collected. AUTHORS: This section is just an introduction, more details are given in the section “2 The Dee estuary”. We have included more references about the Dee in the new version of the paper.

Section 2 page 82 rows 18-21 Does the sentence “The Dee Estuary presents a mixture of sediments containing a range of non-cohesive and cohesive sediments and, therefore, the threshold of motion of the bed might be a complex process dependent on several conditions” report your interpretation of data or some conclusion taken from literature. Please clarify and, if the case, add proper citation(s) AUTHORS: A reference has been included.

Same observation for the sentence in page 83 rows 1-3 AUTHORS: References have been included.

Section 3 pag 84 row 23 Please explicit OBS acronym. AUTHORS: This has been done in the new version of the paper.

Section 4, row 2-4 (pag 86) You write : “Figure 3 shows an example of the despiking algorithm on the data. It can be seen that the method properly removes the spikes.

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It has to be noted that the data was very clean and only a few spikes were found in the raw data." It seems to me that the dataset shown in figure 3 is not "very clean". It seems also that the despiking procedure works only in the first part of the window (from zero to about 2000). AUTHORS:As said before the data comes from a high frequency sampling and thus turbulence data is included, the method removes the spikes (eg. the one above and below -20 and 20 cm/s), the "noise" of the series is the turbulence associated fluctuations.

Section 4, row 18 (pag 86) The PUV method needs a citation even if it dates back to the 1970's and should be known to everybody. AUTHORS: Citations have been included in the new version of the paper.

Section 4, equation 1 All symbols must be explained after the equation, Cp, Cu, , , g are missing. Also give a proper citation for the equation. AUTHORS: This has been done in the new version of the paper.

Section 4, equation 2 Is it an original equation ? if not a citation is due. Explanation of "g" is missing. AUTHORS: This has been done in the new version of the paper.

Section 4, equation 3 Explanation of "f" is missing. AUTHORS: This has been done in the new version of the paper.

Section 4, row 7-10 (pag 87) If the author wish to start a discussion about the benefits of the PUV method more detail has to be given, otherwise I suggest to remove these sentences. AUTHORS: This has been done in the new version of the paper.

Section 4, row 11-13 (pag 87) As said before, more detail has to be given about data access. It may be the case to have a dedicated section to this topic. AUTHORS: More details and information have been provided regarding data access and policy.

Section 5, subsection 5.1 All paragraph To my opinion the hydrodynamic description is too concise and should be extended. The statements expressed in this section need to be supported by data representation AUTHORS: The section has been complemented

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to include some more details on hydrodynamics.

Section 5, subsection 5.2 row 13 and following The sentence :". . . the distributions correspond to times when the smallest particles dominate (to reduce possible shifting of the distribution due to flocculation)." needs to be clarified. "It shows a dominance of small particles with a diameter of around 70 microns which represent the limit between silt and very fine sand, " ok " there is also an important contribution of fine sand. " too short, please clarify. To my opinion this figure deserve a deeper comment, since the ms focusing on sediment transport. ", Both locations show the same pattern in size distribution," ok " but larger concentrations at the Welsh channel." Too short, please clarify and possibly give a reason to this feature. AUTHORS: This has been improved in the latest version of the paper. The size of particles in suspension changes with time due to flocculation processes, and thus, to provide a better estimate of the particles sizes in suspension (without flocs) distributions with lower peak size were selected.

Section 7 "Conclusions" To my opinion this section looks like more to an introduction that a conclusion. In conclusions you should summarize only the "findings" of you experiment and/or the benefits effectively given to the scientific community. I suggest to write a shorter, clearer conclusion. AUTHORS: The section presents a summary of the paper outlining the benefits of the data set presented. The section has been slightly shortened in the latest version of the paper.

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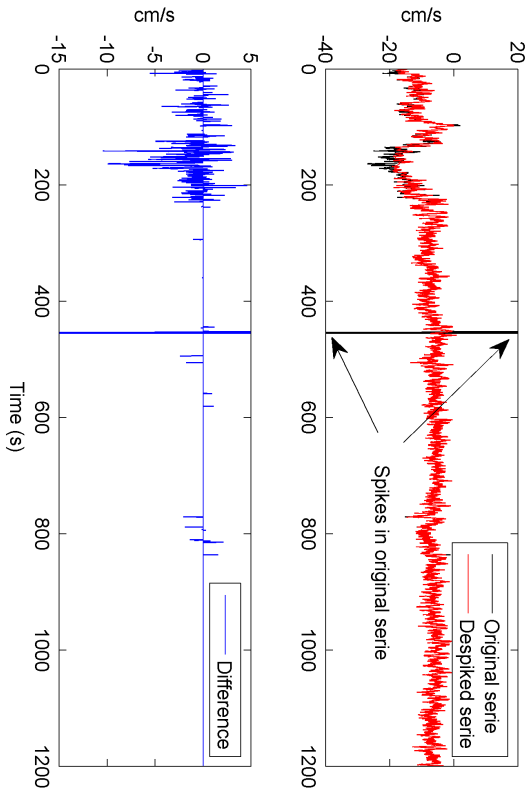

Fig. 1. New figure 3

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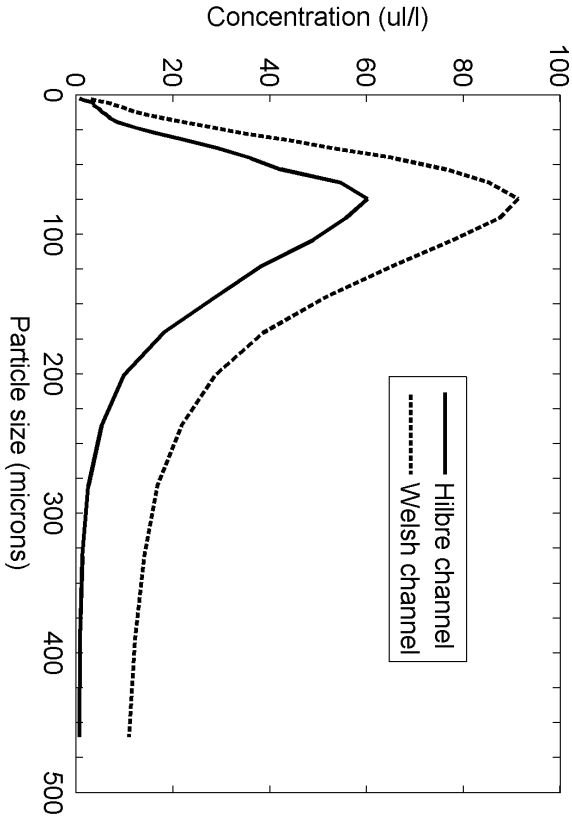

Fig. 2. New figure 5

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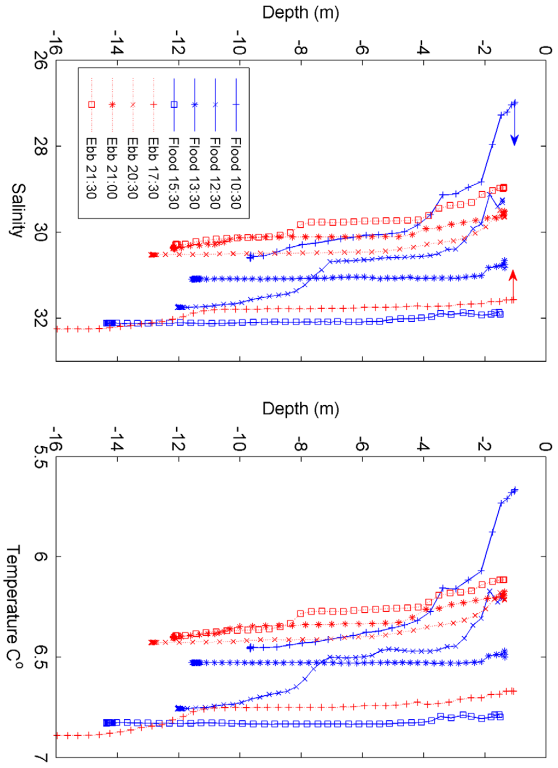

Fig. 3. New figure 7

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