

## ***Interactive comment on “An Accurate and Homogeneous Altimeter Sea Level Record from the ESA Climate Change Initiative” by Jean-François Legeais et al.***

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We would like to thank reviewer #2 for his/her contribution to our paper. First, an anomaly occurred in the numbering of the sections (there was two section 4). This has been corrected.

Text modifications:

Review 2, comment Page 2, row 4: “in the Abstract, authors mentioned about the GCOS requirements. But no clear explanation is given in the Abstract nor in the Introduction. The reader is left without clear explanation about what actually are the GCOS

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requirements.”

Answer to reviewer:

We agree that more details on what are the GCOS requirements would be useful.

Text modified:

We have modified the end of the introduction with the following: “The sea level errors and uncertainties are discussed in Sect. 6 with respect to the GCOS requirements (GCOS, 2011). They correspond to error levels to be met by the sea level record at different spatial and temporal scales (e. g. long-term evolution, inter-annual and annual signals). These requirements have been considered as a reference within the CCI program and especially when assessing the quality of the SL\_cci ECV. The paper finishes with the discussion of the perspectives of evolution of the sea level products.”

Review 2, comment Page 6, row 10: “Author wrote ‘In the v1.1 SL\_cci ECV, a 1 mm jump was found in the GMSL around mid 2008’. Is this referred to Fig.4? If so, please indicate in the sentence.”

Answer to reviewer:

This jump in the v1.1 GMSL is not explicitly shown in the paper but is partly visible in the v2.0 – v1.1 GMSL differences shown in Fig. 4.

Text modified:

This has been mentioned in the text: “In the v1.1 SL\_cci ECV, a 1 mm jump was found in the GMSL around mid 2008 (partly visible in the v2.0 – v1.1 GMSL differences shown in Fig. 4).”

Review 2, comment Page 7, row 26: +3 cm<sup>2</sup>. 2 should be written in superscript.

Answer to review and text modified: Done.

Review 2, comment Page 24, Figure 3: “Does the x-axis referred to Years? If so, please

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indicate. The legend should be improved. What are the solid and dashed lines in black (and dashed lines in yellow)?"

Answer to reviewer:

The x-axis is the time (years). Note that following the comment of reviewer #3, Fig. 3 is now Fig. 1.

Text modified: The figure has been updated so that it is clearer for the reader and the legend of the figure has been updated: "Figure 1: Comparison of the SL\_cci v2.0 global MSL (solid orange line) with the associated linear trend (dashed orange line) and the ensemble mean (solid black line) of the global MSL derived from different groups (DUACS DT2014, CSIRO, Colorado University, GSFC and NOAA) with the associated linear trend (dashed black line) during the period 1993-2015. During this period, the trend of the SL\_cci global MSL amounts to  $3.3 \pm 0.5$  mm/yr in a 90% confidence interval. The grey envelope shows 1.65 standard deviation of the ensemble mean (90% confidence interval). The seasonal variations have been removed and an offset has been introduced so that the mean of the 1993 data is set to zero."

Reviewer 2, comment Page 24, Figure 4: In the Figure caption and text, Author highlights a jumped about 1mm in mid-2008. Unfortunately, the jump is not obviously appeared in the Figure. I suggest the author highlights the jump area by showing it in a scar-box.

Answer to review and text modified: The figure has been adapted and the legend has been updated accordingly: "Figure 4: Global mean sea level differences between the SL\_cci ECV v2.0 and v1.1. The trends are indicated for the periods 1993-2003 and 2004-2014. No trend difference is observed between ECV v1.1 and v2.0 during their common period 1993-2014 (not shown). A jump is observed in mid-2008, illustrating the anomaly of ECV v1.1 that has been corrected in ECV v2.0 (see the black box)."

In addition, the overall quality of the written English has been improved following the

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review of co-authors. Figure 16 has been changed in landscape format and the presentation of Figure 17 has been improved. Additional evolution of the text and figures has been provided following the comments of reviewers #1 and #3.

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