
GENERAL:

The authors propose to recover surface water mass change from laser measurements data provided by the GRACE-FO mission and reduced for continental hydrology. This type of data ensures a better temporal resolution that enables to detect intra-month mass variations due to climatic events more accurately. Mapping of surface water mass is fast by considering the transfer function approach developed previously by Ghobadi-Far et al. (2018). The following discussion about the data frequency content and its exploitable bandwidth of the KBR and Laser Ranging Interferometry (LRI) related to surface spatial resolution remains very interesting, even if the question of improving the spatial resolution itself is much debatable due to remaining cross-track errors by considering the Ghobadi-Far et al. filtering, as it is shown numerically in the document. Moreover, the availability of these new type of LRI dataset is proposed and this would be really appreciated by research community. The quality of the presentation of this original work is very good and deserves to be published in ESSD once some minor corrections will be made (see my comments below).

R2C1: We sincerely thank Dr. Ramillien for reviewing this work. We appreciate the reviewer's comment regarding the interpretation of spatial resolution. In fact, our aim is to provide a dataset with emphasis on temporal resolution, rather than spatial resolution, for prompt detection of short-term mass change. To avoid any possible misunderstanding, we have carefully revised the manuscript to clarify this point where appropriate.

MINOR CORRECTIONS

P.5. It would be simpler to explain that the raw along-track LRI observations are reduced in the GOCO6s software from known accelerations, including gravitational potential models listed in Table 1.

R2C2: Thank you for this helpful suggestion. We now explicitly state that the first step aims to reduce the raw along-track observations (LRI1B and KBR1B) by removing all known gravitational and non-gravitational contributions unrelated to terrestrial hydrological mass variations.

P.8. "using least-squares": is this a kind of 6-parameter least-square adjustment for each SH coefficient (constant term + linear trend + annual and semi-annual terms)? Please precise.

R2C3: We clarified. The least-squares adjustment used here is not a six-parameter model. Instead, each cosine and sine spherical harmonic coefficient is fitted separately using a 13-parameter model comprising one linear trend and 12 monthly climatological coefficients, one for each calendar month. The model can be expressed as:

$$y(t_i) = \dot{y}(t_i - t_0) + \sum_{k=1}^{12} M_k(t_i)\beta_k + \varepsilon_i$$

where $\dot{y}$ denotes the linear trend, t_0 is the reference epoch of GOCO06s (i.e., 2010.0),

$M_k(t_i)$ is a month-indicator function, and β_k represents the monthly climatological mean coefficient for month k . An initial fit is performed, observations with residuals exceeding three standard deviations are identified as outliers, and the model is then refitted after excluding these observations. We have added appropriate details to the revised manuscript. This explains the climatological patterns better than a combination of the sinusoidal (annual + semi-annual) functions.

P.16. "20° of the equators": do you mean a 40° band of latitude centered on the Equator? Please precise.

R2C4: Yes. We have revised the wording to “within $\pm 20^\circ$ of the Equator” to make it more precise.

P.20. "southeastern United States (SEUS)": "SouthEastern United States (SEUS)".

R2C5: Done.

In all the document:

Please check the definition of acronyms, e.g. SEUS looks to be used in the text before being defined. Write "Line-O-Sight (LOS)" instead of "line-of-sight (LOS)"

R2C6: Thank you for these careful suggestions. We have thoroughly reviewed the manuscript to ensure that all acronyms (e.g., Southeastern United States) are defined at their first occurrence. In addition, we have revised line-of-sight (LOS) to Line-of-Sight (LOS) and ensured consistent usage throughout the manuscript.

Text in the figures are sometimes too small, e.g. Figures 7 and 9. Please redraw them with larger text if necessary.

R2C7: Revised. We have enlarged the text size in Figures 7 and 9 to improve readability.