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Open Access Earth System Science Data Discussions

Interactive comment on "Sea-level fingerprints emergent from GRACE mission data" *by* Surendra Adhikari et al.

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The authors describe a new dataset of sea level fingerprints (with and without rotational feedback) computed from GRACE gravity data from April 2002 until August 2016. I want to applaud the authors on making this dataset available to the wider community. As they summarize in their introduction, there is a lot of interest in these products, and until now users have had to rely on help from experts to produce such maps. This new dataset will allow many more scientists access to such maps.

The methods are well described, the dataset is important, and I recommend publishing with only some minor revisions, mostly to clarify sentences in the introduction and to clear up some potential confusion in their choice of variables in the derivation.

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Discussion paper

Although the authors have already released spherical harmonic solutions of their results, I would like to encourage them to also release maps of the combined relative sea level fingerprint signals. Not all scientists interested in these data (such as those who utilize gridded altimetry products) will be able to convert from spherical harmonics to sea level fingerprints directly. If only spherical harmonics are released, they will either not use these data, or else they will continuously pester the authors for the maps. It seems to me that it would be simplest to also release gridded products for at least the sea level studies. I leave it to the authors as to whether they want to do this, but I strongly encourage it.

Minor comments:

1. Page 2, line 1: "...informative models about global sea level variability...." I think the authors should be clear that they are talking only about the sea level variability due to self-attraction and loading here, and not all sea level variability (like from changes in ocean currents, winds, or heating/cooling).

2. Page 2, lines 33-35 and page 3, line 1. This is a very long sentence with multiple clauses and a little difficult to follow, primarily because the main point is buried near the end of the sentence. I suggest rephrasing and get to the point quicker: "This paper describes a dataset of monthly changes in relative sea level, geoid height, and bedrock displacement induced by mass redistribution from land to ocean. They are derived from Release-06 GRACE data..."

3. Page 3, line 5 – misplaced reference. Johnson and Chambers, 2013 describes changes in ocean circulation, not terrestrial water storage.

4. C(t) in equation (2) vs C(lat,lon) in Equation (3). I am concerned these may be confusing to some readers, because they are very different variables, but both are denoted C. Considering C(lat,lon) is just (1 - O(lat,lon), and O(lat,lon) is used later (but not C(lat,lon), I suggest dropping C(lat,lon) and using (1-O(lat,lon)) and revising the text below Equation (3).

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