

Interactive comment on “Accuracy assessment of global internal tide models using satellite altimetry” by Loren Carrere et al.

Anonymous Referee #2

Received and published: 30 July 2020

In this work the authors assess the accuracy of 7 internal tide models and their ability to for correcting satellite altimetry data sets. Three different types of models are included: empirical, assimilative and hydrodynamic. The models are compared amongst each other in a qualitative and a quantitative approach; then their ability to reduce variance of SSH and SLA from satellite altimetry is assessed.

General comments:

The manuscript is well-written, laid out clearly, and is easily readable. It could benefit from some improvements in the grammar used.

The figure labels are hard to read as they are very small and some information which is repeated on every figure panel could be omitted and/or moved to e.g. the caption.

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No method is numerically explained using an equation/equations – the authors should consider adding these for clarity and for ease of anyone else wanting to repeat or carry out a similar analysis.

Detailed comments:

L136: How is this map constructed?

L240: Why do you specifically select these two regions for the comparison?

L294: Does a simple standard deviation give you the most robust measure of variation between the models? Would you not expect larger variations in areas with larger amplitudes? What about including a measure of e.g. STD normalised by the mean amplitude?

L296: Why does the DUSHAW increase the STD so much?

Lines 333-357: What time periods do the two datasets span?

L390: What resolution do the JS and CS tracks have?

Table 4: check that the highlighted values really correspond to the best reduction. E.g. for J2, crossover, Madagascar EGBERT gives the best reduction, not ZARON.

Figure 13: In this figure the caption (percentage of IT signal removed) does not correspond to the y-axis label (ratio of power spectral density ($\text{cm}^2.\text{km}$))

Figures general:

- You tend to use the same color bars for all subplots in your images. You could plot one large colorbar at the bottom with labels that have a bigger font size. The resulting white space could be used to make the plot titles larger (see next comment).
- Your subplot titles include information that is repeated multiple times – e.g. in Fig. 7 all subplots have ‘Mission j2, cycles...’ – could this go in the caption? Make the plot headers larger as they are not legible at 100% size.

Technical comments:

L49: at -> et

L57: coming -> upcoming

L88: proposed -> presented

L108: fit -> fitted

L109-110: grammar

Table 2: use consistent notation (comma or dot)

L296: notice -> note

L375: The altimeter SSH using successively each of the IT corrections tested → The altimeter SSH using IT corrections from each model, resectively, ... (successively is used in a confusing way more than once in the document – check the other occurrences)

L432: ZHAO model -> the ZHAO model

L433: four models, RAY -> four models RAY,...

L450: notice -> note

Figure 9a: RRAY -> RAY

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