

Interactive comment on “Water discharge estimates from large radar altimetry datasets in the Amazon basin” by A. C. V. Getirana and C. Peters-Lidard

Anonymous Referee #1

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Review of manuscript "Water Discharge estimates from large radar altimetry datasets in the Amazon basin" by Getirana and Peters-Lidard

This study aims to compute rating curves between discharge output by model runs and altimetry derived water levels. It presents very interesting results.

However, I have the following major concerns:

- Credit to previous works, including those by Getirana (!!), is incomplete
- The so-called Relative Error criteria. Maybe it is a typo error but as it is given in Eq

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5, this criteria is rather meaningless. Indeed, it varies from $-\infty$ to $+\infty$, and is zero simply when the two signals (x and y) have the same mean. Which is absolutely not a criteria of good fit. Surprisingly, the formula given for RE in the present study is completely different from that used in Getirana et al., *J. of Hydrology*, 2011 (Eq 8)

- The computation of the Z parameter. The method used in the present study is very similar to that presented in Leon et al., which is not acknowledged in the manuscript. Besides, it is very difficult to admit that changing the z value by tens of meters until unrealistic values does not change the value of R^2 , when it changes that much for realistic values. I think that it is not possible to consider z values so far from reality as a good result, as provided in Figure 4 (z is negative in first exp shown...). Also, the method failed to provide a z value for a half of the series. Anyhow, if true, this suggests that R^2 is not a good criteria and another criteria must be sought. It seems that the authors used sat series on the Rio Negro, same as it was done in Leon et al. 2006 or in previous studies by A. Getirana himself. In all these studies, the method is said to work well. Authors must compare their results with all these studies and explain why their results are so poor compared to these previous studies. This also holds for the depth values, that could be compared with known values.

- In my opinion, the study should include comparison with in-situ data, in order that both the part played by sat altimetry on the one hand, and by discharge modelling on the other hand can be evaluated separately, before both dataset are put together. Such a comparison should include a comparison of the model discharges with gauge discharges, a comparison of the altimetry heights within the gauge readings, and a comparison of the rating curves computed in this study with the in-situ one. This paper is not the first one to show that rating curves could be determined using model outputs of discharge and sat altimetry. Its interest must be found elsewhere. So, the computation of rating curve is interesting if the coef are published, in order that other investigators can re-use them or compare them with their own findings. I suggest that the coefficients are given in a table, maybe in an appendix. Other possibility could be

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to mention at the end of the paper that they are provided on request.

Therefore, I suggest a major review

Minor comments : - At the end of the reading, it was not clear for me what were the reasons for data pairs to perform well or bad. A sentence such as "accuracy is highly sensitive to the quality of the input data" bears no information. It must be reworded. Similarly, naive sentences such as "the calibrated rating curve parameters may not be reflective of the actual channel hydraulics" (§5, line 25-26) should be avoided. The parameters do reflect the channel hydraulics, even if difficult to interpret.

Figures: - in the version that I got/downloaded, figures are so small that it was almost impossible to see in detail. In particular, text strings within the figures are really unreadable. Authors must redraw the figures. For figure 4, I suggest that the formulas are put in the legend, or listed in a table instead of being written inside the figures.

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