

## ***Interactive comment on “River monitoring from satellite radar altimetry in the Zambezi River Basin” by C. I. Michailovsky et al.***

**Anonymous Referee #2**

Received and published: 17 April 2012

The authors describe three methods to obtain discharge estimates for the Zambezi river based on ENVISAT altimeter data.

This is generally an interesting paper. It is well written and follows a clear structure. The abstract is clear and reflects well what the paper intends to accomplish and the introduction is well written and covers enough background material.

After reading this paper I think it's definitely worth publishing after revision. I have listed below some comments and concerns that should be addressed:

1. P 3207 L 20: What retracker was eventually used?
2. P 3208 L 15-20: this paragraph needs more explanation. It is not clear where this information on dB comes from. Is this another data set that was used here?

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3. P 3209 L 4: the authors need to justify better why they chose to apply outlier removal for flows. Also, what method (test) was used to decide on outliers?

4. P 3211 L 14: I do not understand this last sentence: how can you compare levels from instruments using two different vertical data? If I understand correctly, the RMSE adjusted just means that it compares the in-situ with altimetry that was accounted for it not being at the same location. This still leaves you with very different vertical data and presumably the in-situ ones are most of the time local datum???

5. P 3212 L 2-3: You need to explain or justify why you assume a kinematic approximation.

6. P 3214 L 20: dlow is of course not the real depth; it is rather the water level at low flow, so how does this impact your results? As far as I can see this was not taken into account in the uncertainty analysis...

This comment above relates also to my major concern of this study which is that the authors claim to be able to measure discharge from altimetry but with the presented methods this is very much restricted to very favourable three conditions that need to be met and as such the methods are not applicable globally. The authors should discuss this limitation and be more upfront about it. The three conditions that need to be met are: 1) field data need to be available or 2) a rating curve needs to be available or 3) the river needs to run practically dry for some months

7. P 3215 L 19: 10 m in width is rather optimistic.

8. I think the discussion and conclusion should be two separate sections.

9. The two thick black lines in Figure 6 are not distinguishable.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 3203, 2012.