

Dear authors,

Thank you for submitting the 2nd revision of "Analogue modelling of basin inversion: the role of oblique kinematics and implications for the Araripe Basin (Brazil)".

This is an interesting manuscript, which stimulates the scientific debate on inversion and uplift mechanisms of the Araripe basin.

- **Answer:**

- We thank the editor for considering our manuscript and the positive evaluation.

Based on my own reading, some additional clarifications are needed.

In particular, you claim that the analogue models involving syn-rift sedimentation and orthogonal shortening with respect to the rift axes do not show basin inversion features. However, figures showing the topography insinuate uplift along the basin bounding normal faults and thus inversion of the basins. This feature has already been highlighted by R1 in the previous round of review. In your rebuttal you explain these linear features as artifacts related to placing the final layer of syn-rift sediments. This needs to be explained in the manuscript, as their meaning is not that obvious from the DIC data in the manuscript figures and the supplementary material and the reader keeps wondering about their meaning.

- **Answer:**

- Thank you for pointing that out, we have now clearly explained this feature that might be confusing from the topography figures.

In your rebuttal you elaborate that the aim of the study was not to quantify the amount of uplift as inferred from the analogue experiments, but to gain insight on the "large-scale structures" accommodating the uplift. Also this item needs to be spelled out and justified in the in the manuscript.

- **Answer:**

- Indeed, we do not pretend that our model captures all minute aspects of the Araripe basin, and such detailed topography comparison would therefore not really be that useful. We have added a couple of nuances to the end of the introduction, as well as at the end of section 2.1 (model set-up) and believe that this should avoid possible confusion.

Other minor items:

L73: analogue modelling by itself is not a "new approach". Please rephrase.

- **Answer:**

- Thank you for the remark, we modified it to “additional approaches” to avoid confusion.

Figures showing maximum normal strain superposed on top-view photographs are often hard to read because of the unfortunate use of a color pallet from yellow to red. In particular the yellow denoting low strain areas is almost indistinguishable from the sand color in the background. Please change the color pallet to increase readability of the figures.

- **Answer:**

- In fact, the background top view pictures of the experiments are in grayscale, therefore all colors displayed in the DIC figures are purely showing the maximum or minimum normal strain results. To avoid any confusion, we have added this detail to the figure captions.

Make sure that the letters related to the figure numbers in the topography plots (eg. 6f or 6n) are readable. Black on dark blue is hard to see.

- **Answer:**

- Thank you for the suggestion, we modified it.

L502: Panien et al. 2005 instead of 2005b.

- **Answer:**

- Thank you for the suggestion, we corrected it.

L515: Discussion on conditions for fault-reactivation: here you should quote the works of Rick Sibson who started to work on this topic in the late 80's of the previous century.

- **Answer:**

- Thanks for the suggestion, we have now cited Sibson (1985 and 1995) with respect to the fact that normal faults tend to not reactivate when put under orthogonal compressional stresses.

Looking forward to receiving the revised version of the manuscript.

Ernst Willingshofer