

Dear Mohamed,

Manuscript Revision - Along-strike variation of volcanic addition controlling post breakup sedimentary infill: Pelotas margin, Austral South Atlantic” by Cassel et al.

We have revised our manuscript in response to reviewers comments and have loaded it onto the Solid Earth website. We have responded to all reviewers comments and we believe that the revised manuscript has greatly benefited from the reviewers' comments. The track changes version of the revised manuscript shows our revisions. In some cases our comments in the right-hand margin of the track-changes document explain where we believe that the reviewers' comments or suggestions are incorrect.

Below, we briefly summarise our responses to the main comments made by the two reviewers.

- R#1 (reviewer 1) suggest that we should restructure the paper with a primary focus on modelling. We very much disagree and see our paper as being primarily observational. The purpose of the simple model that we use at the end of the discussion is to attempt to understand our observations. Our intention is not to use our observations to test a mode.
- R#1 suggest that we omit the analysis of the Rio Grande do Su Cone profile S3 because that profile has very large thicknesses of sediment. This suggestion misses the whole point of why we flexurally backstrip the 4 sections to determine water loaded post-rift accommodation space. We have explained the purpose of flexural backstripping in more detail to hopefully remedy this. We also emphasise that its aim is to determine water loaded post-rift accommodation space and not to produce a restored cross-section at base post-rift (we intentionally do not reverse model post-rift thermal subsidence).
- R#1 correctly identified inconsistencies in our reporting of observed TWTT of first volcanics. We have revised text and figures to be consistent.
- R#1 requests that we justify the seismic velocities that we use for depth conversion of sediments and SDRs. We have done this. We also explain that SDR seismic velocity has no impact on our results since we do not flexurally backstrip the SDRs to determine post-rift accommodation space.
- R#2 (reviewer2) proposes that we work with depth converted cross-sections and make our observations in depth not TWTT. We disagree and explain that, because of

substantial uncertainties in the seismic velocities required for depth conversion, depth sections are very inaccurate. We have explained more clearly why we prefer to work with time domain seismic section, TWTT being the primary observation and not dependent on the seismic velocity model.

- R#2 requests that we provide more information about the SDR formation processes and the nature of the basement onto which they are deposited. We explain more clearly that our observational strategy does not require these to be known and that we deliberately avoid speculative interpretation of SDR formation process and basement type.
- R#2 request that we also quantify intrusive magmatic addition. We explain that such quantifications are extremely inaccurate and ambiguous and that we deliberately avoid doing this.

Regards,

Marlise