

Dear Federico Rossetti,

Please find below my review of the revised version of the manuscript “Mechanical compaction mechanisms in the input sediments of the Sumatra Subduction Complex – insights from microstructural analysis of cores from IODP Expedition 362” submitted by Sivaji Lahiri, Kitty L. Milliken, Peter Vrolijk, Guillaume Desbois, Janos L. Urai.

Most but not all of the suggested changes to the initial manuscript have been accepted by the authors. However, I still recommend to strongly considering some modifications to the initial version. In addition, some aspects, which have not been part of the initial manuscript, require some modifications according to my point of view. These points are outlined below.

Kind regards,

Bernhard Schuck

- 1) Referring to “comment 2” and “comment 6” in my review of the initial manuscript: I highly appreciate that the revised manuscripts is substantially more specific about the samples’ mineralogy and the methods used to analyse it. However, while lines 273/274 specify that EDX analyses revealed the presence of K- and Na-feldspar, results of XRD analyses presented in table 1 only give the presence of plagioclase. This difference should be at least explicitly mentioned or discussed.

The reference McNeil et al. (2017; <https://doi.org/10.14379/iodp.proc.362.102.2017>) actually only refers to the methodology applied to study the bulk rock composition. Page 10 of this methods report does not only provide values to assess the errors in XRD analysis but also states that “the method [of XRD] described is semiquantitative and results should be interpreted with caution”. The authors should provide these information on errors and limitations of the performed XRD analyses in the manuscript.

Furthermore, the supplementary material providing bulk rock compositions has a doi (<https://doi.org/10.14379/iodp.proc.362supp.2017>) different from the one indicated in the manuscript. Therefore, I suggest to use McNeil et al., 2017a and b as references.

Using two digits to present “quantitative” bulk rock compositions suggests an accuracy of the results which is not justified – especially considered that the reference (McNeil et al., 2017b) only uses one digit to present bulk rock composition. For the same reasons I recommend to not provide any digits at all to present the bulk rock composition in table 1.

- 2) Referring to “comment 4” in my review of the initial manuscript: As far as I remember the Zeiss Supra series uses a field emission gun. There I suggest to modify lines 157 – 161 as follows to clarify the infrastructure used for microscopic analyse:

“Samples have been prepared using Ar-ion cross-section polishing and analysed using a scanning electron microscope equipped with a field emission gun (BIB-SE technique). “The first sample set (33 mud samples; depth 1.24 to 1300 mbsf) was prepared and analysed at RWTH Aachen University, Germany. The second sample set (22 samples; depths 6.25 to 1493.30 mbsf) was prepared and studied at the Bureau of Economic Geology (BEG) at the University of Texas at Austin.”

Please note that the fact that the Zeiss is a FE-SEM implies that minor corrections to lines 327/328.

- 3) Referring to “comment 10” in my review of the initial manuscript: Please add the following sentence after the first sentence in line 305:

“From this section four samples have been analysed in Aachen as well as in Austin, respectively.”

- 4) Referring to “comment 11” in my review of the initial manuscript and to “comment 1” of this review: please modify the reference “McNeil et al. 2017” to “McNeil et al. 2017b (<https://doi.org/10.14379/iodp.proc.362supp.2017>)” to make it easier for readers to also obtain the data used.
- 5) Referring to “comment 12” in my review of the initial manuscript: I still do not see how Figures 2a & b (and Table 1) support the statement that “Shallow samples from Unit-I are richer in smectite content than the deeper samples” (line 466). Both, the figures and tables show that the indeed smectite content decreases below Unit I. However, below approx. 400 mbsl smectite content increases / is elevated compared to the section between 28 and approx. 400 mbsl (see also lines 136/137 and 631/632). Therefore, I suggest to modify the statement in line 466 and discuss this observation.
- While doing so, I strongly recommend to also taking Figures 2e & f into account, which might indicate increasing porosities towards the bottom of the drillhole. Given one of the major outcomes of the study presented (cf. lines 20/21) this observation should be discussed.
- 6) Line 580: Please rephrase the sentence.

Figure 1:

- The line indicating the location of the seismic profile (b) on the satellite image (a) is yellow, not red. Please correct.
- Please provide the orientation of the seismic profile (i.e. “SW” and “NE”, respectively)

Figure 12g:

Still the “increase in preferred alignment of the long axes of pores” cannot be seen on the conceptual sketch, i.e. the pores’ long axes appear to already have a preferred alignment in stage one, which does not change in succeeding stages. The figure should be modified to emphasize the proposed increase in preferred alignment more clearly.