

I have found a few minor issues that should be corrected during the further proofing process:

General:

- Please check that all units are correctly attached to their respective quantities. Sometimes a line break separates units from their quantity. This is also the case for the numbering of some elements, e.g. sometimes phase 1 is split by a line break. Consider using a protected space ("Shift + Space" in MS Word or a fiducial ", " in LaTeX). Usually, this is also checked by Copernicus' copy editing.
- Also sometimes there are spaces between dashes and values and sometimes not. E.g.: "3-4 cm" vs. "3 - 4 cm".
- Sometimes you are using abbreviations for specific units, sometimes their full name and for some structures you introduce an abbreviation but it is never used later on. This should be consistent throughout the manuscript. I know this can be confusing to the reader but I am also not sure if it is better to abbreviate the structures or to always give the full name. Both have advantages and disadvantages.
- Check for language consistency (American or British English), e.g. "analyzing" (US) vs. "analysing" (UK) and "analog" (US) vs. "analogue" (UK). Maybe this is also done by Copernicus.
- Check that all references have a DOI. This will definitely come up during copyediting...

Specific (line numbers refer to the manuscript pdf version 5):

L28: "... extension, and eventually..."

L35: doubling of "significant" and "significance"

L66: doubling of "kind of", second one can be removed

L87: split sentence here: "...the North Atlantic Ocean. Its configuration..."

L102: maybe remove "(initial)", as it also appears in the next sentence

L114+: "...Red box shows the study area. B) Structural map of the Barents Sea shear margin. Note the segmentation of the continent-ocean transition..."

L126: "...Results from the experiments..."

L128: split sentence here: "...deformation. Additionally, they allow to identify..."

L137: Please check the spelling of each of the structural elements in the whole manuscript, sometimes each word is capitalized, sometimes only the names, e.g. "de Geer zone" vs. "De Geer Zone" or "Barents Shear Margin" vs. "Barents Sea shear margin"

L161: "c." -> either "approx." or "ca." (also check other appearances in the manuscript, e.g., L407)

L183+: I think here "continent-ocean transition" is sufficient, as it was previously defined like this and is named "COT" again in the next paragraph.

L193: "...area east of the ..."

L198: "... coincides with the southeaster ..."

L209: "... which is interpreted..."

L210: double use of "which" in one sentence. Consider rephrasing.

L211: Duplication within the sentence, remove one of these: "has been associated with shear" or "affiliated with the development of the shear margin"

L212+: Maybe the sentence could be split here: "...(Riis et al., 1986). Although it was a positive structural element from the middle Cretaceous to the Pliocene, it may also have been activated earlier."

L218: "...splitting off of slivers..."

L223: "...even during the earliest..."

L228: "In particular, the hanging wall..."

L237: "...dense in the northern ..."

L239: "...study area, while previously published correlations provided calibration and age of each mapped seismic horizon."

L244: Please check your links. www.npd.com leads to an American consumer survey and trend monitoring company which has nothing to do with geoscience at first glance.

L246: Maybe rephrase to: "The folds are usually located in the hanging walls of extensional faults, and the fold traces and structural grain of the thick-skinned major faults are generally parallel."

L258: Maybe rephrase to: "...dynamic, so the ultimate architecture of such systems contains structural elements that did not emerge simultaneously."

L330: "...sheet represent the oceanic..."

L333+: Maybe rephrase to: "To simulate the ocean-continent transition, a sand wedge was made with a constant slope angle determined by the thickness difference between the intact and the stretched crust, covering the width of the silicon putty layer (Figure 3B)." I think that is easier to follow than the current sentence.

L340+: Maybe format the "Segment 1", "Segment 2" and "Segment 3" sentences as a list:

- Segment 1: ...

- Segment 2: ...

- Segment 3: ...

L411: "...crust (20-30 km, Breivik et al., 1998)."

L412+: "The brittle crust, represented here as dry feldspar sand, deforms (...) putty shows ductile deformation and folding."

L415: I think "configuration" fits better than "geometry" here.

L418: Maybe rephrase to: "After the experiments were completed, they were covered with a thin layer of sand to stabilize the surface topography before the models were saturated with water and cross sections were cut across the velocity discontinuity in a fan shape (Figure 3C)."

L430+: This might have been mentioned before and could be an unnecessary repetition.

L444: "...in the text (Figure 4)."

L446: "... (BarMar6) compared to ..."

L455: "...development are displayed..."

L457: "...morphology, as seen on the surface, were detected in the different stages of the

experiments."

Table 1: PSE-4/Orientation -> "Parallel master fault in restraining bend"

L478: Replace "very initial" with "first"

L479+: Rephrase: "In particular, in segments 1 and 3, there is a series of oblique en echelon folds between Riedel shear structures (PSE-1 structures) oriented approximately 135° (NW-SE) to the regional VD, which rotate in the NNW-SSE direction by continued shear."

L492+: Rephrase: "After a horizontal displacement of 0.25 cm in segment 1, which included releasing and restraining bends separated by a central strand of neutral shear, a slightly curved surface trace of a NE-SW striking, top-to-NW trending normal fault developed in the southernmost part."

L517+: "...that steepened downward, with the deepest parts..."

L521: "..shallowest sequences developed at a later..."

L527: no hyphens between "horse tail like", also true for some other combined words. I am not a native speaker, so it is also not always clear to me when to use a hyphen and when not.

L530: Rephrase: "The structuring in Segment 2 was determined by the pre-cut crescent basement fault (velocity discontinuity), which caused the development of a releasing bend along its southern boundary and a restraining bend along its northern boundary (Figure 11)."

L582: Split sentence here: "... (see below). But these..."

L589: Move "however" to the start of the sentence: "However, the northern..."

L591: Mind the hyphens: "Thus, faults 6 and 7 delineated a growing, crescent-shaped, 5-7 cm wide thrust structure..."

L593: Rephrase: "Continued shearing gave these structures the character of an antiformal stack."

L602+: You could shorten "Riedel-" and "Riedel'" to "R-" and "R'", like you did previously.

L673: You could remove the parentheses: "In our experiments, the extension phase was followed by an oblique contraction parallel to the extension direction, as used in each experiment."

L674+: Split sentence: "More common, however, was the reactivation and rotation of faults that had developed during the strike-slip and extension phases. So was the development of isolated folds, often associated with inverted fault traces, producing structures such as snakeheads or harpoon structures (References et al...)."

L680: Rephrase: "The predominant structures associated with the contractional stage were still..."

L682: "...direction and subparallel to the pre-existing main fault systems ..."

L687: Here the colon could be replaced in "...length to amplitude ratio..."

L692: I think "attitude" should be replaced with "orientation"

L722: I think "jogs" should be replaced with "deflections"

L730: spacing between "...marked with "3"..."

L735: Rephrase: "Fault 3 continued to breach the basin fill even after the basin fill exceeded the original basin margin."

L738: Rephrase: "Note that figures "H" and "I" (bottom right) are viewed from different directions than the other figures."

L752+: Rephrase "Note that the fold axes are mainly parallel to the basin margins, but deviate in some cases in the central parts of the basins."

L783+: Split sentence here: "... Vestbakken Volcanic Province. The part formed by basin widening through sequential footwall collapse formed a shallower subplatform (sensu Gabrielsen, 1986) (Figure 11)."

L786+: Maybe rephrase to: "The master fault strand is accompanied by faults with significant normal throw on its hanging wall and is part of the larger Knølegga fault complex." Do I understand this sentence correctly?

L790: "2000 ms" I think milliseconds is wrong here, and why the 3000 meters in parentheses?

L797+: Maybe rephrase to: "They are located in both the footwall and hanging wall of the boundary faults and strike parallel to them, and the axes of these structures are parallel to the main faults."

L840+: Split sentence here: "...Knølegga fault complex. However, new transverse faults within the basin that had developed during the shear stage (see above) were also reactivated and contributed..."

L842: Rephrase: "It is unlikely that a stage..."

L844: Rephrase: "... may have occurred."

L882-899: I think the font has changed here, but Copernicus should correct that.

L882: Add comma between "...steeply incline, closed to open..."

L884: No comma before "and". (Check also other occurrences in the manuscript)

L888: "...wavelengths on the order..."

L913: I think "attitude" should be replaced with "orientation"

L920: Rephrase "...these structures cannot be dated by seismic stratigraphic methods (onlap configurations, etc.), we assume that these fold extensions can be correlated with the tight folds..."

L926: Comma is separated from its word.

L929: Rephrase: "Because of the internal configurations, the three segments..."

L941: Rephrase: "By constraining the experimental model to the outline of the boundary geometry and introducing a dynamic stress model consistent with the latest understanding of regional tectono-sedimentologic evolution, we were able to interpret the observations from the reflection seismic data in a new light."

L958: Rephrase: "...our model shows that the initial architecture of the edge is indeed important and..."

L984: Rephrase: "Comparison of seismic mapping and analogue experiments shows that one of the major challenges in analysing structural patterns in shear margins with complex geometry and multiple reactivations is the low potential for preservation of structures formed in the earliest stages of development."