

Response to Technical Corrections

Line 14-15 – “Dislocation-free plagioclase and Kfeldspar aggregates fill the microfractures”

Comment: It is a very minor point, but for sake of clarity, considering that the authors discuss the fluid infiltration along the coseismic microfractures associated with earthquake propagation, the term “filling” may be misleading. The authors interpret the fracture “filling” as the result of the modification and repolymerization of the pseudoamorphous cataclastic material formed along the cracks derived from the host-rock feldspars. I suggest to use the term “occur” (“Dislocation-free plagioclase and Kfeldspar aggregates occur along the microfractures). In fact, across the manuscript the authors never use any more the term “filling” for the feldspar within the microfractures.

Instead of replacing “fill” with “occur” we have edited the sentence to read “Dislocation-free plagioclase and K-feldspar aggregates *in* the microfractures *record* a history of fluid introduction...”

Lines 39-41 – “Furthermore, for ambient lower crustal temperatures in the range 600-700°C, the transient temperature following an earthquake may exceed 1000°C within 1 cm of the slip surface (Bestmann et al., 2012; Clerc et al., 2018). Such conditions, although short-lived, are expected to drive irreversible processes within the rock record.”

Comments:

A) This part is a little “out of order”. The authors first discuss the dynamic stress field, then the thermally induced stress and finally go back to the dynamic stress. I suggest to re-order this part.

We have put the thermal anomaly part before the dynamic stress part.

B) In addition, the authors refer to the “irreversible processes” caused by the the thermal pulse associated with the frictional heating. These include thermal fracturing in addition with the annealing processes dealt with in this paper and in Bestmann et al. (2012). The authors can provide specific references to thermal shock fracturing. A reference to thermal shock fracturing (Papa et al. 2018) and pulverization (Reches and Dewers, 2005) have been included to support our statement of “irreversible processes”.

C) “°C” is a unit measurement symbol. Here, and across the whole text, the authors should put a space between in front of this symbol, e.g. change 1000°C to 1000 °C.

This has been fixed throughout the text.

Line 50 – “... to a lower crustal pseudotachylyte”

Suggested editing: “... from a pseudotachylyte vein formed under lower crustal conditions”

Edit accepted.

Lines 72-74 – “University of Oslo’s Department of Geoscience.”

Suggested editing: “Department of Geoscience at the University of Oslo” (consistently to how the other Institutions are reported in the manuscript)

Edit accepted.

Line 111 – “At distances less than the half thickness of the pseudotachylyte (x), ...”

Comment: The parameter “a” in the formula (the pseudotachylyte half vein thickness) is not defined. Please add this information.

We thank the reviewer for pointing out this small (but very important) technical error. “a” is now defined as the half thickness of the pseudotachylyte.

Lines 121-22, 123-124 “... with a mean grain size of $1.73 \mu\text{m}^2$ ” and “) with a mean grain size of $2.14 \mu\text{m}^2$ ”

Comment: as written it is not clear if the grain size refers to the grains in the microfractures or to the pseudotachylyte grain size. Please clarify.

These few lines have been edited to clarify that we mean the grain size within the microfractures.