

Interactive comment on “Microscale strain partitioning? Differential quartz lattice preferred orientation development in micaceous phyllite, Hindu Kush, northwestern Pakistan” by K. P. Larson et al.

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We appreciate the review of our work by Dr. Chris Wilson. Below is a detailed response to each of his concerns/suggestions. Please see the review by Dr. Wilson for context.

Title

We have changed the title to reflect usage of crystallographic fabric throughout and fixed the tautology.

Abstract

C1065

We disagree. While the last sentence is saying something similar to the first sentence, only those who read far into the first sentence will get it that same meaning. Those not looking for such a meaning will not. Including the sentence at the end of the abstract says it explicitly ensuring no one will miss one of the main points of the study.

Introduction/Geological Setting

Line 23: We now recognize that LPO may not be an appropriate term. We have change mention of LPOs to crystallographic fabrics throughout.

Lines 28-32: Disagree – serves the point that quartz fabrics have been examined from many angles for a long time.

Lines 34-37: References added.

Line 38: Reference included

Lines 45-48: Deleted.

Lines 54-57: Deleted.

Line 59: Deleted.

Lines 76 – 78: We do not recognize the unnecessary repetition of references. Appropriate studies are cited for the background geology of the region and then cited for the age of specific plutonic bodies. With the removal of the Bumi-Zom pluton there is only one reference to each study.

Lines 83-84: Deleted

Line 88: Inserted

Methods

Line 100: ‘geo-oriented’ has been deleted and replaced with ‘oriented’

Line 102: Done.

C1066

The reviewer is incorrect in his assumptions about the instrument used to conduct the analyses presented in this study. The reviewer assumed the G50 fabric analyser used was a lower resolution glaciology version, which is not the case. The G50 used is the latest generation G50, which was effectively equivalent to the G50- RGB described in Wilson and Peterzell, 2011. The main differences being an effective resolution of 5 microns (this instrument) instead of 2.8 microns (G50-RGB) because of a longer focal length imaging lens in the later. The actual 5 micron resolution (though 10 was used as indicated in the manuscript) is significantly finer than the 50 micron resolution assumed by the reviewer. The other difference between the G50 used and the G50-RGB referenced by the reviewer is the inclusion of RGB LEDs in the vertical position. The G50-RGB uses these LEDs with a monochrome CCD sensor, whereas the instrument used in this study instead incorporates a colour CCD sensor with a RGB filter matrix and a white LED in the vertical position. In practice there is no discernable difference between the systems.

The reviewer's incorrect assumptions about the instrument used negates their concerns about potential bias associated with older, lower resolution instruments. The G50 fabric analyser used has no horizontal bias. The horizontal data are considered robust. The only analytical bias is actually against vertical c-axes as they provide low contrast when illuminated from different angles and therefore their position is difficult to determine accurately.

Line 105: Done.

Line 109: Done.

Lines 123-127: The first sentence has been moved to the 'Geologic Setting' section as suggested, however the remainder of the paragraph has been kept in this section as it describes the orientation of the stereonet to be discussed.

Line 129: 'Textures' has been replaced with 'Microstructures'.

C1067

Lines 145-155: We agree that this paragraph was a bit confusing we have taken care to make the observations more clear. This has included some rewriting of troublesome sentences and re-organizing the paragraphs slightly to allow more natural flow between topics.

We do not, however, agree with the reviewer's assessment of the bulk fabric data. As discussed above, the instrument used is not subject to a horizontal orientation bias.

Lines 167 – 169: We disagree with the reviewer's assessment. The lines simply make an observation that the shear sense is consistent with inferred movement on a nearby fault. This is true regardless how far away the specimen is. There are no other structures nearby with a similar interpreted displacement direction; it seems reasonable to mention it.

Lines 170-177: As discussed above, the reviewer's assessment of the data was made based on incorrect assumptions. We view the data as robust.

Lines 194-204: While some of this portion could be reduced by forcing the reader to seek out details in references, it is already concise, properly referenced and provides the basic information necessary to read-on about deformation temperatures. It is a service to readers who may not be entirely familiar with deformation temperatures.

Lines 215-244: This again comes back to the assumptions made by the reviewer. Because we view the data as robust the discussion of those data is relevant.

Discussion

Unfortunately it appears as though the reviewer was sent an earlier version of the manuscript to review than that used to create the type-set manuscript online. A few significant changes were made to the original text after some initial comments by the handling editor including a significant shortening of the discussion to remove repetition (it was shortened to 26 lines from 39 lines). The reviewer's point is well taken and the discussion is shortened in the version published as the discussion paper.

C1068

Line 289: Changed for crystallographic fabrics

Figures

Fig. 1 – Reference to Buni-Zom has been removed from the text as it is outside of the area in the figure. Representative structural measurements have been added across the mapped area to provide a better sense of regional structure.

Fig. 2 – Line 311 – Deleted; line 312 – changed; lines 313 and 314 – the sizes of these populations are mentioned in the text of the manuscript with relevant statistics. It is unnecessary to repeat them here. B) We disagree that this portion of the figure does not add any value to the paper. XPL photomicrographs help demonstrate the characteristics and structure of the specimen. Other readers may find it interesting and valuable.

Fig. 4 – As discussed throughout we maintain that the bulk analysis data are robust. The caption has been reworded to indicate that we used an 8000 point grid to generate the bulk fabric.

This figure was changed after initial submission after an initial read-through by the handling editor. Appropriate labels for the stereonet are included in the discussion paper published online. Unfortunately, it appears these changes did not make it into the reviewer's copy for some reason.

Line 330 – Changed. The quality of the data is considered robust. The instrument used does not have a horizontal bias. It was not a glaciology version of the G50 as assumed by the reviewer, please see above.

Interactive comment on Solid Earth Discuss., 6, 2735, 2014.