

## ***Interactive comment on “Pluri-decadal (1955–2014) evolution of glacier–rock glacier transitional landforms in the central Andes of Chile (30–33° S)” by S. Monnier and C. Kinnard***

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This study discusses glacier-rockglacier transitions and changes over time of selected rockglaciers in the Andes of Chile. This is a very interesting and timely contribution on a less studied rockglacier area that can add to the understanding of rockglaciers and their climatic and geomorphological significance. The paper is well written and nicely illustrated. The paper could, though, benefit from a broader view and discussion of the changes seen.

I have however a major problem with the displacement measurements presented, which are a or even the core of the study. For me, most of the displacement vectors look like mis-matches, i.e. wrong measurements. In parts, especially on the glacier

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parts, it is very hard for me to imagine that there are corresponding points that are preserved and can be matched over tens of years. Without checking the original images used, it is however not possible to me to judge this thoroughly. I offer to the authors to contact me directly for further details and solving my concerns. In sum, for me the quantitative results of the study are for now under a big question mark.

Further comments:

Page 7/line 14: Which software did you use for matching?

7/17: did you test your DEMs for lateral offsets and higher-order biases?

7/25: I don't understand fully: you used the airphoto DEMs for differencing, but they were too bad to use them for orthorectification?

8/1: better not to use 'vertical displacements' for elevation changes and thickness changes, as 'displacements' suggests that particles are moving vertically, which is not the case for the type of DEM differences you observe.

8/12: You need to show and discuss the DEM differences on stable ground. This would be a good indicator of the uncertainty.

Show all images, not only for Presenteseracae Fig 8, so that the reader can judge by himself. Perhaps in an Appendix.

11/17, and 13/27: show and discuss stable ground displacements and DEM differences

17/16 and other places: you should discuss the processes potentially involved in the rockglacier/glacier changes observed more broadly and complete. For instance, what about potential changes in debris production, debris budget, debris evacuation, glacial transport, etc.

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