

## ***Interactive comment on “Use of an ultra-long-range terrestrial laser scanner to monitor the mass balance of very small glaciers in the Swiss Alps” by M. Fischer et al.***

**M. Fischer et al.**

mauro.fischer@unifr.ch

Received and published: 2 May 2016

- Personally I consider more easy for reading to report the acronyms of the glaciers rather than the entire name. For example by including their acronym (Glacier de Prapio (PRA), Glacier du Sex Rouge (SER), St. Annafirn (STA), Schwarzbachfirn (SWZ) and Pizolgletscher (PZL), as you reported in the Table 3) in the Study sites section. If you change their name, then you should verify that you change it throughout the whole paper.

We'd rather keep the glacier names as they are in the text and only have their acronyms in selected tables, as we did in the TCD version of our manuscript.

C1

- Page 7, line 9: I suggest to change "the second point cloud" with "the other point clouds" or "the unregistered point clouds" as one point cloud was fixed (e.g. the 2013 scan) and then the others two (e.g. the 2014 and 2015 point cloud), were co-registered using stable areas. Similar comment at line 12

Now changed accordingly.

“Changing surfaces (mostly reflections from snow and ice in our case) of the second, unregistered point cloud were selected and temporarily removed until it only consisted of stable terrain, . . .”

“Manual coarse registration was performed in order to approximatively shift the unregistered point cloud into the local coordinate system of the registered one.”

- Page 11, line 5: Please change "the latter" with " $\sigma$ MSA".

Done

“ $\sigma$ \_MSA ranged from +/-0.05 to +/-0.18 m. . .”

- Page 12, line 7: (Fig. 3). Please add the name of the glaciers as done for Tab. 3, example..., line 10. (Fig. 3, examples for St. Annafirn and Pizolgletscher)

Implemented as suggested.

“The accuracy of the TLS-derived surface elevation changes and possible trends in elevation differences are assessed by comparison of consecutive DEMs over stable terrain outside the glaciers (examples for St. Annafirn in 2013/14 and Pizolgletscher in 2014/15 in Fig. 3).”

- Page 18, line 14. As a first sentence of the Discussion section I suggest to make clear that the average value is for the glaciers measured with both TLS and ablation stakes.

We think that this is already clear from our wording:

“the uncertainty in the TLS-derived annual specific geodetic mass balances  $\sigma$ \_B\_TLS

C2

of the four very small glaciers in Switzerland measured with both methods is  $\pm 0.13$  m w.e. yr<sup>-1</sup> (Tab. 4).”

- Page 20, line 12: Ins-situ ->in-situ

Done.

---

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2016-46, 2016.