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Interactive comment on "Measuring Decadal Vertical Land-level Changes from SRTM-C (2000) and TanDEM-X (∼ 2015) in the South-Central Andes" *by* Benjamin Purinton and Bodo Bookhagen

Anonymous Referee #1

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The study analyses elevation differences between the SRTM and TanDEM-X DEMs over mountain terrain. The processing procedure to reach maximum accuracy and to remove various horizontal and vertical shifts is sound, but the geophysical results are more sparse than expected. My comments:

(1) The study is mostly a method presentation, the results are less spectacular than the reader expects ("novel", "first time"). I strongly recommend to tone done the latter type of announcements to make the reader not expect dense measurements over an entire mountain region.

(2) Perhaps show and analyse (sediment fluxes) the entire river reach covered not only a subsection.

(3) Page5Line5, and else: land level changes are measured for instance using medium resolution ASTER data. Tome down "for the first time" if it refers to medium resolution. Also, are you sure that no landslides etc. have been measured using SRTM and TanDEM-X before? Also, TanDEM-X is in my view a high-resolution sensor, not a medium resolution one.

(4) P2L6: be less strict. ASTER timeseries detect a few cm/dm per year over 10-20 years (=dm-m total change)

(5) P2L14: what about ArcticDEM, HighMountain Asia DEM, ALOS PRISM AW3D? I wouldn't call them limited spatial coverage.

(6) Section 3 (Correction...) is rather part of the methods.

(7) Fig 8 and 9: you also need to show the results outside the masks in order to let the reader judge the statistical significance.

(8) Fig 8: I guess these magnitudes of changes would also be visible in ASTER time series, or ASTER versus SRTM (for instance;Castro et al. 2016 (Nature Comm Art 13585), Brun et al. 2017 (in your list), Girod et al. 2017 (doi: 10.3390/rs9070704), Wang et al. 2015 (doi: 10.3390/rs70810117))

(9) Fig 9: The landslide dh would also be visible without your processing, I guess. You could use this (and the river) to visualize the importance of your processing in more detail (before-after processing).

(10) P19L7-8: How are uncertainties computed? StDeviation, StError (if StError, how computed?). How aggregated and how voids filled?

(11) P30L31: it is not that easy to account for radar penetration! It exceeds often the actual elevation change signal, and the correction magnitudes applied here. See above

ASTER studies, and others.

Detail comments

page 1, line 2: rewrite 1st sentence. "Vertical change is measured in the cryosphere ...". I understand what you mean, but what is "measuring in the cryosphere"?

P1L4: typically much smaller (landslides, as the one you show later, are a frequent exception with vertical changes on the same order of magnitude as glaciers).

P18L15: leaves stripes noise at the expense of preserving ... ? Other way round?

Interactive comment on Earth Surf. Dynam. Discuss., https://doi.org/10.5194/esurf-2018-51, 2018.