

Interactive comment on “Recent geodetic mass balance of Monte Tronador glaciers, North Patagonian Andes” by Lucas Ruiz et al.

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This is a well-conceived and executed investigation of glacier mass balance based on height differences between a pair of DEMs derived from satellite measurements. My comments are as follows.

The seasonality correction, which the authors state is the 2nd most important source of error (section 5.1), is based on stake measurements made in 2013, 2014 and 2015 (section 3.2). I believe this assumes that all Monte Tronador glaciers lost mass at the same rate of 1 m w.e./yr between February and April in both the years 2000 and 2012, but Fig 6a shows 2000 had a large positive temperature anomaly in the region compared to the later years. Also, it seems there would be a substantial spatial variability in the seasonality adjustment. It seems that a greater effort could have been made to

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estimate/model this adjustment. Also, What is the rationale for using ± 1 in the error estimation (section 3.6.3)?

p.4,l.20 - “integer time span” - needs units (i.e. years) p.5,l.19 and l.25 - seems that screening for dh outliers is done twice, initially by the ± 100 m threshold and then again when averaging in elevation bands by rejecting dh outside of 3 sigma. explain why, and provide % rejected by these procedures. In fig. 3 are the outliers included or excluded? caption says “all data”. p.5,l.24 - mixed tense. if “were analyzed” then must say “we averaged” p.5,l.33 - isn’t Pangua a more dramatic example? p.6,l.12 - “i” should be subscripted p.6,l.13 - “it” should be “its” p.6,l.19 - “represent” should be “represents” p.7,l.4 - “assumption” should be “assumed” p.8,l.9 - unclear what comparative “more” refers to. Is “most” the intended word? p.10,l.21 - “the thickening of the debris layer due to the melting of glacier ice” needs clarification. if ice melts under the debris cover it simply lowers the glacier, increasing the relative, but not absolute thickness of the debris cover. Debris cover can increase only by deposition or convergence. p.10,l.29 - change “hypothesized” to “hypothesize” p.11,l.1 - “ice flux is compensating the mass loss due to surface climatic mass balance” p.11,l.5 - “contrast” should be “contrasts” p.11,l.12 - “a shift towards slightly more negative values” is not supported by the data; difference is within estimated error p.25, Table 4. Include the error estimates for each figure in the table.

throughout - inconsistent capitalization and abbreviation of “Figure” throughout - change “we” and “w.e” to “w.e.” where necessary

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