Glacier changes on Sierra Velluda massif, Chile (37°S): mountain glaciers of an intensively-used midlatitude landscape by Fernandez et al.

The paper primarily supplies details of satellite remote sensing of a system of 13 glaciers in central Chile over 1960-2007. It appears to this reviewer (who is not experienced in remote sensing) to be strong on that subject but to be weak on glaciological interpretation; there should be a table, for instance, giving basic geometric properties of the glaciers: area, altitude range, aspect.

The paper's principal result (Fig 6) shows that altitude change is negative and is nearly independent of altitude. The authors seem to be unaware that the overwhelming pattern worldwide is that altitude loss decreases from the terminus to the higher parts.

The paper is moderately well prepared but would benefit from assistance with the English. Some papers cited in the text do not appear in the list of references, and some in the list are not cited.

Comments in the following are indicated by page and line (page,line)

(5,19) The range of the summations in Eqn (1) are not defined nor are the units. The form of the relation seems peculiar, for I would expect something more like

$$U_T = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\lambda_i^2 + \frac{1}{m}\sum_{i=1}^{m}\epsilon_i^2}$$

under the assumption that the individual λ and ϵ are mutually uncorrelated.

An excellent reference is Bevington (1969) *Data reduction and error analysis for the physical sciences* New York, McGraw-Hill.

(6,1) Eqn (2) also seems peculiar. Unlike Eqn (1), here there is no square root on the second term. Comments at (5,19) apply here.

(6,10) faces and tandems need to be defined.

(7,11) Does "one GPS" mean one GPS station with accurately know position ?

(7,15) Is sector here the same thing as area at (7,14) ?

(7,17) Change "n" to n and also at (7,26)

(7,30) The caption of Fig. 2 needs to define the coordinates in a and c.

(8,5) Why the *Gaussian* distribution is rejected because $p > 0.1$, whereas at (8,9) the *normal* distribution is rejected because $p < 0.01$ should be explained.

(9,5) Does this refer to the one GPS mentioned at (7,11) ?

(9,22) A reference for the Durbin-Watson test would be useful.

(11,1) I am unable to read Spanish.

(13,1) It would be helpful to give the aspects in Table 4. To make space for them, latitudes and longitudes could be given in degrees to two decimal places, as in most glacier archives, instead of in degrees, minutes, seconds.

(13,20) Stating percentage changes to the nearest tenth of a percent, here and elsewhere, is not warranted by the accuracy of the numbers divided.

(13,23) Giving the entire code RC108376/1 instead of just 76/1 would make for easier reading.

(13,31) Instead of repeating in the text much of the material in Tables 4-6, it would be better to mention the possible causes, such as changes in precipitation and temperature.

(14,5) Here and in many other places appears the term "map algebra," which ought to be defined at its first appearance or perhaps a more widely understood term could be used instead.

(14,14) Although -0.51 ± 0.67 m/yr, over 40 years, might not be significantly different from zero in a statistical sense, it is highly significant glaciologically and climatologically, which should be acknowledged.

(14,19) Is inside the range meant ?

(14,22) Fig 6b shows an extremely weak altitudinal variation of the change.

(14,28) Saying 12 out of 13 would be more informative than 92%, and Table 6 does not give confidence intervals of the rates.

(16,17) These response times are extraordinarily short.

(24,2) This table is hard to understand. Why are there both rows and columns for MSS, ETM+, ASTER but only a row for TM ? The TM and ETM+ rows are identical. It would be easier to read were the values not repeated in two places, such as the 124.1 and 0.02 for MSS and ASTER.

(25,1) Quantities in Table 3 are inadequately defined. Are trends m of error per km of altitude ? See comment (9,22). Rows 2 and 3 have different values but have the same label.

(26,1) The inventory system in which the glacier numbers are used should be identified. Perhaps RC refers to Rivera, Casassa.

(27,2) Because |0.01| is positive, it would be less confusing for RC108370/5, for instance, to give -0.003 km^2/yr

(28,1) That glacier RC108376/2 shortened (-353 m) and thinned (7.25 m) but gained area (0.14 km^2) is worthy of comment.

(32,1) The glacier should be identified. It would be interesting to see the 1828 to 2003 lengths plotted as in Fig. 5

(33,2) Fig. 5 would be easier to interpret if the letters were also shown in Tables 4-6. The variables in the figure are length and area relative to 1960 for a-k, relative to 1974 for l,m. It should be said that the scale for the relative length (red) is given at the left in m and for the relative area (blue) at the right in km^2.

(34,2) Period of the changes shown in Fig 6 should be stated. Its horizontal scale in b would be much clearer were its tick marks labeled only at 2100, 2200, ..., 3600. Units are needed on values in the legend, which seems to have its signs reversed.

Somehow locations of the 13 glaciers represented in Tables 4-6 and in Fig 5 should be shown, possibly in Fig 6a but perhaps by creating a new panel Fig 6c.

(35,1) "relative altitude distribution" apparently is the fractional area within 100-m altitude intervals.