

Interactive comment on “Do crustal deformations observed by GPS in Tierra del Fuego (Argentina) reflect glacial-isostatic adjustment?” by L. Mendoza et al.

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Review of “Do crustal deformations observed by GPS in Tierra del Fuego (Argentina) reflect glacial-isostatic adjustment?” submitted to TCD by Mendoza et al

The authors approach a very interesting topic and one that requires careful analysis given the likelihood of multiple geophysical processes acting at once. The topic is certainly of interest to the audience of TC, although at present the interpretation of the presented results does not present a clear cryospheric angle. The work here is based heavily on the manuscript submitted to GJI which the authors have helpfully provided. The GPS data analysis is first rate and the subsequent analysis appears rigorous.

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Major comments: 1. The manuscript leans toward the “conference proceedings” line, presenting preliminary results, but with possibilities of another paper in the near future giving results with wider ramifications. At least this is my interpretation of the potential of vertical velocities presented in Figure 10 of the GJI paper, but only a subset of them used in this manuscript. I don’t know the brief from the guest editor in this regard.

2. Some of the results presented here appear to me to be repeat of work already presented in the GJI submission. For instance Fig 2 here is an uncited repeat of part of Fig 10 GJI together with information that seems to be in other figures there. The vertical velocities are shown verbatim, so these are not the novel aspect of the presented work.

3. If the novel aspect is not the data, then it is presumably the suggestion of a tectonic micro-block (detailed nicely in Figure 3) which could explain the anomalous vertical velocities, and that GIA is not observable in the presented network. The plausibility of this needs to be assessed by a tectonics person.

4. If the GJI paper is not accepted for some reason, then this paper will become an orphan with insufficient detail. Maybe this will be sorted with a quick acceptance in GJI.

5. The results here are presented without uncertainties, unlike in the GJI paper – they need to be added and considered in discussion. In particular I wonder how the authors have dealt with temporal correlations in the data – I didn’t see this in the GJI paper and I’m pretty sure that errors do not decorrelate totally just because they are campaign measurements.

Detailed comments: The paper is well written. P1636 L9-10 – these observations need not be GPS or GNSS – this reads too much like a line for further funding! The key is further geodetic observations. L19 – the authors may wish to consider including the recent Surv Geophys review paper on this topic

P1637 L12: “vertical” -> horizontal vels are considered as well

P1638 L4 – I think the jury is out that these monuments (or others) are “the highest

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quality” L7 – e.g., to Altamimi et al? L14 – “forward” -> “provide” L15 – “retread” -> “retreat”

P1639 L12 – this fault should be marked on Figs 1 and esp 2. The anomaly of site 1 should be discussed, especially with such a small site selection. L27 – do the authors intend to *entirely* attribute the motion to tectonics, or is just tectonic motion dominating any GIA?

P1640 L11: begin line with “a “; is not a counter argument that the tectonics are causing net subsidence in this area and GIA brings it back up to zero? I think there’s some information in the GJI paper that will negate this, but it’s not presented here. Of course, tectonics are not my strong point! L23: “are *continuing*” L27 :”allow *us* to”

Figures: Fig 1: could the authors add an outline of the Ferragno glacier (as best as it is known). Add box on the inset plot showing region. Add RIOG to the large figure if included

Fig 2: add uncertainties. Caption: the figure needs a citation to the GJI paper.

Matt King, Sept 2010

Interactive comment on The Cryosphere Discuss., 4, 1635, 2010.

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