

Anonymous referee #1

We wish to thank the referee since he understood the main purpose of our paper that was to provide to the scientific community the very first GPS ground deformation background knowledge about the active and hazardous S. Miguel volcano in El Salvador.

1. We preferred to use the weekly solutions for several reasons:
 - a. Continuity - Data were not very continuous in time, acquisitions at different stations were often interrupted for several reasons, mainly for power supply problems. So, daily solutions do not show very continuous plots. By processing a week of data, we overcame this problem since, during an entire week, all stations acquired for a couple of days at least 8 hours of continuous data.
 - b. Quality – daily solutions are obviously more noisy, especially considering that often some stations are missing and consequently the network is not always the same; furthermore, stations did not always acquire for the entire 24h sessions so, even when processed, they can have different amount of data and this further increases the instability of the daily solutions.

Considering the small and slow expected deformation and the not very long time-period investigated that do not allow slow trends to be clear above the daily noise level, we wanted to work for the most stable solution, reaching a compromise between the temporal resolution and the accuracy of the results. We described this choice at p. 6124, lines 19-22, but we can further improve this part in order to make it clearer.

2. The errors are those provided by each weekly final network adjustment. We can write this in the paper.
3. Right. We cannot exclude a volcanic source. Our hypothesis was only based on the fact that this deformation was continuous, was observed only on one side of the volcano and mainly in N-S direction. We agree that the tectonic origin could not certainly be the only cause. We will rewrite this part.
4. The first paragraphs of the chapter 7 are devoted to describe the three-dimensional coordinates series, from line 13 to 25. As stated in the following lines, we then discuss the baselines in order to overcome common fluctuations of the coordinates solutions due, for example, to reference system or atmospheric noise. Baselines monitoring is commonly used for volcanoes in order to detect intrusions or inflation/deflation dynamics producing local deformation. Deformations are often very little and can be masked by general network noises or, even worst, noise can simulate fake deformation that can be wrongly interpreted.
5. Geochemical sensors were multigas and uvscanner for measuring CO₂/SO₂ and SO₂ flux, respectively; FTIR to observe SO₂/HCl and SO₂/HF. We will add these descriptions this in the manuscript.
6. Radiometric sensors measured the volcanic plume temperature. We will add this description in the manuscript.
7. Yes, mainly to the environment but not only; to the budget, for example (with respect to a pillar). The minimum impact allows also the benchmark to be easily hidden and this reduces the chance of it being damaged and vandalized. We can better explain in the paper.
8. OK. We will rewrite it.
9. OK. We will rewrite it.
10. OK. We will rewrite it.
11. OK. We will rewrite it.
12. OK: we will check and solve.

Anonymous referee #2

We agree that the period is probably too short for deeper investigations and that the measured deformation is quite little; but this is. Unfortunately, we cannot extend our investigation. As stated at page 6124, lines 7-8, stations were removed at the end of April. This period depended on funding and agreements of the international cooperation. So, we are providing information about the entire period the network worked on the volcano.

- CA is the international standard abbreviation for Central America. We will specify it.
- OK. We will fix all abbreviations.
- Ok. We will enlarge them in the figure and explain the meaning of the arrows in the caption.
- It is the daily average of the hourly values of RSAM. The vertical unit is in counts (as usually done for this data); we will write it in the text.
- OK. We will enlarge them.
- On GPS processing, vertical solutions are always much more noisy (usually double) than the horizontal ones. Furthermore, the vertical component of the coordinates are the most affected by atmospheric noise and reference system biases. We simply preferred to deal about and discuss only the most robust information. We described our choices for example at page 6124, lines 19-22 and from page 6125, line 26 to page 6126, line 5.
- As gently suggested by referee #1, the tectonic process cannot be the only hypothesis. We proposed (not really “invoked”) this hypothesis due to the constant, even strong, rate. Small scale tectonic or volcano-tectonic deformation have been measured in the past on similar or even smaller scales (e.g. Bonforte and Guglielmino, *Tectonophys*, 2008; Bonforte et al., *JVGR*, 2007; Houliè et al., *GRL*, 2006; Bonforte et al., *JVGR*, 2013; Gambino et al., *Ann Geophys*, 2011). The main issue is the quite high rate of deformation; as answered to the question gently posed by the first author, we will rewrite better these lines, not excluding also a possible volcanic source for this deformation.

We wish to thank the two reviewers and we will improve our manuscript by applying their comments and suggestions.