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6, C209–C211, 2014

Interactive
Comment

Interactive comment on "Exploring the shallow structure of the San Ramón thrust fault in Santiago, Chile (~ 33.5 S), using active seismic and electric methods" *by* D. Díaz et al.

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1. The seismic lines were acquired using 24 channels seismometer, 24 geophones, and several source points. The location of the geophones (white triangles) and sources (red dots) are presented in Figure A2 of the appendix A. In order to clarify this aspect we will include the sentence: "Profiles P2, P3 and P4 were acquired by using a single streamer of 24 geophones for each profile, while profile P1 was acquired by two legs of 24 channel with an overlap section of 105 m " in the final version of the manuscript.

In the final version of the manuscript, we will include also the following sentence, in order to clarify this point: "In order to generate a detailed tomography across the scarp,

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profiles P1 and P4 were measured using a geophone spacing of 5 m except for the first four geophones of the line P1 where a spacing of 10 m was used . On the other hand, since the north-south topographic gradients are small, profiles P2 and P3 were registered using a nominal geophone spacing of 10 m". About the electric profiles, Profile L1 was measured in three segments of 560 m each. The overlap was of 420 m, and the total length is 840 m. Profile L2 was measured as a single segment of 560 m. Outliers were removed in the pre-processing. 280 points were removed from the raw data set of Profile L1, leaving 1209 points that were used in the inversion process. For Profile L2, less outliers were removed, leaving 985 points to be used in the inversion process.

2. We used the algorithm of Korenaga which main feature is the joint inversion of refraction and reflection seismic phases. The original reference of this method is Korenaga et al. (2000) and a regional scale example is showed in Contreras-Reyes et al. (2008). The selected grid spacing values correspond to a scaling from large to small scale, considering the original values used by Korenaga et al. (2000), which are of kilometric scale.

Fig. 5b, 6b, 7b and 8b present the ray coverage for each seismic line, which provide an explicit visualization of the resolution of the seismic experiment.

3. The VES measurements were performed considering measurements of current and voltages along lines parallel to the fault scarp and not across it. We believe that along these lines parallel to the fault scarp, a 1-D approximation is reasonable and therefore the values obtained are very similar to the resistivity values obtained at the eastern (more conductive) and western (more resistive) side of the ERT result, measured along a profile crossing the fault scarp (profile L2). We named our VES points as SEV1 and SEV2, as seen in Fig. 4. These VES measurements were not located on profile L2 due to access problems in private areas. In page 346, lines 17 to 23 there is already a references to the Res2Dinv inversion routine. This reference is short but informative about the approach used to solve this inverse problem and more information can be

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found in the references cited in those lines. The references for application of ERT will be updated to newer ones in the final version of the manuscript. Formally we have time varying direct currents with low frequencies involved in VES and ERT measurements, so we will change "direct currents" for "currents" in order to avoid misunderstandings.

4. Sensitivity analysis have been performed regarding the ERT results, but there is still uncertainty about the dipping angles, which separate domains of different electrical resistivity values. Therefore, the dipping angles suggested in Figures 9 and 10 are obtained from a joint interpretation of surface geology, seismics (in the case of L1 profile) and ERT results.

5. The word anisotropy is not well used in this context and will be changed. Regarding the changes in conductivity and fluid content. Some clay minerals could cause enhancements in conductivity, but in this case we are in a piedmont area with a high amount of meteoric water reload every year. The geology of this area is characterized by volcano sedimentary units, many of them with high porosity and therefore the role of fluid content in the enhancement of conductivity is considered primordial. Hydrological studies in this area have shown that the water table in the hanging wall is in the order of tens of meters, while in the foot wall is in the range of several tens to one hundred meters. which coincides with our observations. The same color scale in Fig. 9 and 10 will be used in the final version of the manuscript.

6. These formal aspects will be corrected.

Interactive comment on Solid Earth Discuss., 6, 339, 2014.