

Interactive comment on “Three-dimensional approach to understanding the relationship between the Plio-Quaternary stress field and tectonic inversion in the Triassic Cuyo Basin, Argentina” by L. Giambiagi et al.

L. Giambiagi et al.

lgiambiagi@mendoza-conicet.gob.ar

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General comments

REVIEWER COMMENT “Nevertheless the reconstruction provided in the manuscript can be further detailed by providing the interpolation among sections presented in the final model of Fig. 12. The on line paper by Maffucci et al. on the 3D reconstruction of an inverted structure of the Andean retrowedge in the Salta province might be of some help in the implementation of the reconstruction by MOVE software. Furthermore it is

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recommended to improve both in the figure and in the text the use of the time slices derived from 3D seismic data to constrain the kinematics model reported in Fig.11 that are potentially very powerful tools to detect structure kinematics”

To answer this suggestion we: (1) clarify the methodology by adding a description of the 3D model development, and (2) The reviewer suggests providing “the interpolation among sections presented in the 3D model” of Figure 12. We agree with the reviewer assertion, however, this could generate a confuse figure. What we want to show is the interpolation of the Triassic rift master fault to illustrate the geometry of this subsequently reactivated structure.

REVIEWER COMMENT “please cite properly the used software MOVE addressing the society that produces it and the adopted version.”

We properly cite the Move software (new lines 79-80)

REVIEWER COMMENT “briefly explain how the depth of the detachment level has been derived even if you are citing two articles about this point. It is a key information for the entire reconstruction you propose and deserves more attention.”

More specification about the selection of the detachment level are given (new lines 84-88)

REVIEWER COMMENT “It might be useful to cite a recent contribution to the topic of tectonic positive inversion in the Adean retrowedge in NOA to the North of the study area in the Salta province. At the base of this brand-new contribution there is field mapping and structural analysis at the outcrop scale as well as a 3D geometry reconstruction of a reservoir (using MOVE software) of a positively inverted structure whose evolution can be fruitfully compared with those reconstructed in the paper under review.”

The text in the Discussion has been modified to reflect the reviewers’ suggestions and comments.

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Specific comments from reviewer

We have addressed all specific comments as suggested by the reviewer. Except point Page 473 (line 28). We prefer to maintain the denomination of reverse/strike-slip instead of transpressional slip in order to separate strain and stress terms

Figures Figure 2. If possible, indicate, at least, well location

Well locations are indicated in Figure 4

Figure 3: Try to use the same color you used in Fig. 2 for the area of HC exploration

We understand this comment should be for Figure 4. We have changed the unit colors in this figure to meet those in Figure 2.

Figure 4. Modify the symbol for the anticline and change the term “anticline” into “trace of anticline axial surface”

Fixed

Figures 5, 6, 8 and 9: Can you possible add the restored version of the sections, at least in the section where relevant strike slip component along major faults is negligible? It helps in visualizing the amount of shortening or inversion.

We add a new figure in a Supplementary Data (now Supplement A) file with the reconstructions of the Cacheuta, La Piona and Tupungato cross sections.

Figure 11: I highly appreciated the time slices from 3D seismic data added to strengthen the kinematic model. In this light the model could benefit from a better location of time slices in the geological map of the study area and a possible conversion of ms into depths.

We added the location of the time slices in the map of Figure 4.

Interactive comment on Solid Earth Discuss., 7, 459, 2015.