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Interactive comment on "Geometry of the inverted Cretaceous Chañarcillo Basin based on 2-D gravity and field data. An approach to the structure of the western Central Andes of northern Chile" *by* F. Martínez et al.

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Main suggestions

Although there are several different types of classifications, the term rift basin is more specifically used to for basins which tensional stress regime is attained by dynamic processes in the mantle. From this point of view, we interpret the Triassic to lower Jurassic basins as related to rifting processes due to the fragmentation of the Pangea (Charrier, 1979; Uliand and Biddle, 1988; Uliana et al., 1989; Mpodozis and Ramos, 1990,

amongst many others). In Central Chile and west-central Argentina, the Late Jurassic-Early Cretaceous was a period of important extension in the back arc region (Charrier et al., 2007) governed by the subduction dynamics (Mosquera and Ramos, 2006; Ramos, 2009), i.e. negative trench roll-back velocity (Ramos 1999). I suggest the authors to discriminate the two periods of extensional tectonics: Triassic-Lower Jurassic rift basins, and Upper Jurassic – Lower Cretaceous extensional back-arc basins. Re: It was done. We have incorporated new paragraphs (see lines 30 to 48).

In the Gravity and structural modeling section discuss the evidence that allow you to choose west-dipping structures instead of east-dipping ones. This turns to be later - in the Discussion section – a very important point to discern between the different structural models presented by other authors, although to discriminate between them what you need are kinematic indicators for movement along the EB-AG fault. Re: We have incorporated new paragraphs to explain better this interpretation (lines 276, 286-288, 294-295, 313, 385-386). On the other hand, we need to inform that it is difficult to observe clear kinematic indicators along the EB-AG fault, because the fault plane frequently is buried by recent deposits or is filled by Tertiary intrusions. The manuscript would benefit from the inclusion of balanced cross sections (instead of the schematic ones presented on Figures 10 and 11). Also explain how the depth of the detachment level has been derived. Another point is that normal faults are so steep to be reactivated. Normally, we do not consider a fault with a dip above 60âŮę to be preferentially oriented to subsequent inversion.

Re: It was done (see new figures 9 and 10 as well as the line 315-318 and 393-396), however, the pre-shortening restorations not were included.

Minor comments Pag 1, line 22: Its origin.. Pag 2, line 1: NE- to NW-trending Pag 2, lines 2 and 3: same comment about the type of extensional basin Pag 2, line 7: NE- to NW-trending Pag 2, line 23, change "Early Cretaceous syn-rift succession" by "Early Cretaceous back-arc basin succession" Pag 3, line 2: along instead of over Pag 3, line 5: add it after as Pag 3, line 11: different instead of differing Pag 3, last

paragraph: At this point readers can get confuse to what basin are you refering to, the Triassic-Jurassic rift basin or the Jurassic-Cretaceous back-arc basin Pag 4, line 11: add coma after area Pag 4, last sentence: The eastern part of one stratigraphic unit? I dó not understand this phrase. Pag 5, lines 4 to 11: Add -if data is available - the depositional environment for each unit. Pag 2317, line 13: “NNE-SSW-striking” simplify to NNE-striking Pag 2317, line 26: add thicknesses in both regions Pag 2318, line 13: “NNE-SSW-striking” simplify to NNE-striking. Pag 2318, line 13: which kind of fault? contractional? Pag 2318, line 15: “NNE-SSW-striking” simplify to NNE-striking. Pag 2318, line 15: replace Elisa de Bordo –Agua de los Burros fault system by "This fault" (first it was not described as a fault system) Pag 2323, line 8: Mesozoic instead of Cretaceous Pag 2323, line 22: add S after 28 Pag 2323, lines 22-23: You are dealing with deformation, so put contractional instead of compressive and contractional/strike-slip instead of transpressive Pag 2324, line 17: gravity profiles do not “define”, one con interprete them. Rearrange this phrase Pag 2324, line 20: extensional instead of rift Pag 2324, line 27: extensional instead of rift Pag 2324, line 28 lower instead of early Pag 2425, line 5: The cross sections do not show considerable shortening Pag 2425, line 7: interpreted instead of determined Pag 2425, line 14: Describe in more detail this "drastic wedging" Pag 2425, line 15: fault system instead of fault systems Pag 2425, lines 15-17: this is very speculative. I suggest, if you do not have more data to support this statement, to delete this phrase Pag 2425, line 28: Peña.

Re: All these minor comments have been considered and were corrected.

Figures

Figure 1: Add S after the 30_000 Figure 3. The graphic and numerical scales do not coincide. Check this. Why the trace of the Elisa de Bordo fault does not extend south of the Los Sapos creek? Is it buried? Are you suggesting there is an onlap relationship between the Viñitas Fm strata and the Pabellón strata south of the Los Sapos creek? check the colors of the legend with the colors of the map and the stratigraphic column for figures 3 and 4 Figure 4: Synextension instead of syn rift for the Chañarcillo Group.

which are the evidence to propose the Cerrillos Fm as sag deposits. Postulate this in the discussion Figure 5: Add a reference for each point (1, 2, 3, 4) Figure 8: I cannot find the location where this photo was taken in fig 3. Here you do not see a fault at the contact between the syn extensional Cretaceous deposits and the synorogenic Paleogene strata... Figure 9: This figure is not really necessary. The authors can add the distribution of the gravity stations in the map of Figure 3.

Re: All these suggestions were considered and the corresponding figures were modified.

Interactive comment on Solid Earth Discuss., 7, 2311, 2015.