RESPONSE TO THE REVIEWS (Annoted Pdf, Referee A. Teixell)

We really appreciate the constructive revisions made by reviewers. In the following we state how we have addressed all questions and comments concerning our manuscript.

Regular characters→Reviewers' and editors' comments

Italic characters→Authors' response to reviewers' comments

Referee 1 (Antonio Teixell) comments Specific comments

- L.33: Although lateral to this ms., there are papers that actually describe diapirism and its implications more explicitly than the latter references. In parts of this ms. one detects a tendency of in-house or friendly referencing

- L.35: same as above

Authors: Some extra references that complement the ones already cited have been added. New references avoid in-house or friendly referring and refer to works dealing specifically with diapiric structures (as many of the others that were already cited).

- L.77: these are the authors that should be credited for that?

Authors: Not really. Citations have been properly relocated.

L. 91: Séguret does not say Lutetian I believe

Authors: Yes, he did.

- Figure 2: The cross-section here does not coincide with the trace

Authors: Agree, the cross-section has been replaced.

- L.195: ??

Authors: A more precise geometric description of the outcrop is now provided.

- L. 232: Conglomerates dip towards the contact along most of the oligocene outcrop. An unconformity is unlikely (and see your interpretation of composite line 2).

Authors: Agree. We have incorporated reviewer's idea in the reviewed text.

- Figure 5: It requires a considerable effort to identify the colors of these units in the map, some look very similar, at least to me

Authors: We have modified the colour of the Cuisian carbonate platforms and the Lutetian carbonate platforms to make them easier to differentiate from the Upper Cretaceous limestones. We have also changed the light yellow of Oligocene conglomerates accordingly.

- Figure 5 caption: reference not correctly written

Authors: Thanks to reviewer's correction we realized that the Spanish Geological Survey maps (MAGNA) were incorrectly cited, this has been amended here and all along the text and the reference list.

- Line 286: I this so cathegorically observed in the line? An uninterpreted version of the lines woud help to evaluate and to convince readers that they are not overinterpreted

Authors: In this case we refer not only to the seismic line in fig.7 but also the map in fig.4. The link between Peña Montañesa, Atiart and Montsec thrusts may not be fully (and categorically) observed in the line but a combination of map interpretation and several other seismic lines crossing the one in Fig. 4 allowed us to state what we state in the text. Besides, as suggested by both reviewers, a new figure with the uninterpreted version of seismic lines is provided as Appendix B.

- L. 295: This turns to be a key structure, with more than 5 km of slip to bring the Montsec over the surface and cause its erosion. It is a crucial point that offers a solution to the long-standing problem of the trace of the Montsec thrust in the area, so it deserves to be better documented and discussed

Authors: In the current version, we have considerably extended the reasons why we have interpreted the existence of the Trillo backthrust. In addition, this issue is tackled in the public discussion (see response to CC1/RC1)

- L. 304: *Not in cross-section 2, where it is actually thicker (Trillo block)*

Authors: Thickness is apparent due to the low angle between the sections trace and bedding. A sentence has been added to the figure caption of figure 7 to clarify this point and avoid misunderstandings.

- L. 332: Seen or interpreted:

Authors: Seen. Presence of this triangular piece is supported by the presence of some subhorizontal reflector in CL3 as it is now stated in the revised version.

- L. 390: why? Sorry I don't follow

Authors: In the revised version, we clarify why a thicker Triassic salt is needed (and therefore a salt basin) to accommodate and preserve lower Jurassic and the upper Cenomanian Carbonates.

- L. 406: why not? certainly not salt withdrawal flow, but could well be inflation. The keuper is there...

Authors: As stated, thicknesses and lack of salt structures discard any influence of salt tectonics from middle Jurassic to Cuisian.

- L. 410: Now that you mention the area studied by Ramirez, I can't see from what area were you talking about when you mentioning the lack of thickness changes. Burrel and Teixell and Hudec et at did not talk especifically of the area that is west of that of Ramirez et al. And then if you accept salt movement in Ramirez's area, you can't discard it where the others authors invoked it (which does show thickness changes, I assure you, although of low amplitude, also true).

Authors: Fair enough. In the current version, we have rearranged the citations.

- L. 419: well, there are quite a few diapirs south of the Montsec thrust (Avellanes, Puebla de Castro, etc.)

Authors: We are well aware of that. And these are likely related to the inflation of the southern salt basin. In this paragraph we refer to the "southern pinch-out of the northern salt basin"

- Figure 9e: how do you inject the salt here?

*Authors: We provide a detailed discussion about this in the second paragraph of the discussion. Such discussion is actually announced in the last paragraph of section 4: "*the nature of inflation is discussed in the following section".

- L. 440: a key point

Authors: Yes, we accurately selected the sites to sample and date anticipating their importance for the evolutionary model.

- L. 462: can you explain more ahat could be the reasons for this collapse in the absence of regional extension?

Authors: At the end of the discussion of the revised version, we have added a new paragraph where this topic is discussed.

- L. 474: in-house referencing...

Authors: Some extra references that complement the ones already cited have been added. New references avoid in-house referring.

- L. 575: Can you be more explicit in the origin of the collapse faults, if they are at least Priabonian in age (line 554), when the Clamosa diapir was actually squeezing?

Authors: We suggest that crestal collapse occurred during Late Priabonian to Oligocene and therefore after diapir squeezing. This has been further clarified in the current version: text and figures have been modified to avoid any misunderstanding. Besides, a new paragraph discussion this topic has been added to the discussion section.

- L. 589: yes, could be, you said it

Authors: Agree

- L. 591: Ok but note that this is an interpretation, not an illustrative observation
- L. 591: another inference, not illustration, see comment above.

Some interpretations are listed as facts.

Authors: To avoid misunderstanding with respect to facts vs interpretations we have added that the evolution of the study area that we present is "[…] our emplacement and growth model for the Clamosa diapir, the Mediano anticline and the La Fueba thrust system […]"