

Interactive comment on “Plio-Quaternary tectonic evolution of the southern margin of the Alboran Basin (Western Mediterranean)” by Manfred Lafosse et al.

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In this paper the authors propose a Plio-Quaternary tectonic evolution of the southern margin of the Alboran Sea, mainly based on the interpretation of multichannel seismic reflection profiles and other relevant stratigraphic information and multibeam data. They identify at least two evolutionary phases for this area: (i) a first, mostly compressive phase of Tortonian age, ending during the early Quaternary, with a remarkable development of imbricated folds and local occurrence of volcanism and strike-slip structures; (ii) a strike-slip phase with a significant extensional component, which started after 1.8 Ma; within this phase, an important role has been played by the Al-Idrissi fault

C1

zone (AIF), which splits the Alboran ridge and, according to the author's interpretation, may represent the present-day plate boundary between Africa and the Alboran domain. As a general comment, the paper should be significantly reduced in length and better organized, especially in the data presentation: in the present form, it is quite difficult to follow the text because it imposes to flip from one figure to another. This because the location maps are distributed in several figures, and for this reason it is difficult to understand the key points presented by the authors. I suggest to present a single index map in which all the presented profiles are indicated in bold.

In the paragraph Data, the authors should present the summary of the acquisition parameters used, and the data processing done (better in a dedicated Table)

Another point which should be clarified is the relationship between the Quaternary subsidence and the strike-slip tectonics, as presented in paragraph 4.2.1. Indeed, it is not clear from the text. Is this part important in the general context of the paper?

In addition, I do not see the importance of the question raised in the paragraph 4.3. It is quite obvious that changes in tectonic styles (and the consequent structural elements produced) are related to changes of direction of stress field. The authors should identify what are the most important structural elements derived from the interpretation, and propose a plausible mechanism, avoiding such a long discussion.

Some of the seismic profiles cross the AIF. Apparently, in the presented data it does not appear as a regional, relevant strike-slip fault accommodating the oblique movement between the two domains. In the earthquake distribution map, the main clusters are located to the south, within the Nekor Basin, and only few events are located at the Alboran ridge. Have you an interpretation about this? Possibly we are facing not a single structure, but most probably a sequence of sub-vertical lineaments distributing the strain, or, in other words, a diffuse transfer zone.

Most of the presented seismic profiles contain the interpretation superposed. This makes difficult to the reader to follow the interpretation and verify its goodness. For this

C2

reason, I suggest to present the uninterpreted and interpreted version of the lines (as an example, the profiles in Fig. 6).

Finally, I suggest having the text corrected by a native English speaker.

Based on the above, I suggest a moderate revision for this paper.

Specific points:

Line 41: takes control?

Line 52-53: ...around 8-7 Ma in the ...

Line 62: Dot after the)

Line 64: use the acronym WAB

Line 66: delete "this"

Line 77: ...of the southwestern...

Line 78: We analyze

Line 84: write "is", instead of "corresponds to"

Line 108 and 111: extensional

Line 129: has triggered?

Line 133: relative displacement? Please explain which plates are involved

Line 160: multichannel seismic profiles

Line 171: ...interpretation to perform the...

Line 178: why you use this acoustic velocity? Have you performed velocity analyses on the data? This should be clarified

Line 183: sedimentary sequence

C3

Line 192: evidence

Line 198: ...to a 4-8 km wide conic...

Line 199: This sentence is unclear...rewrite

Line 212: unconformably

Lines 219-220: conversion in depth based on what velocity? (see comment above)

Line 225: this sentence is unclear...

Line 241: this sentence is unclear...

Line 247: ???

Line 254: ...fault zone composed by...

Line 290: why sinistral shear? Explain

Line 292: ..Quaternary at...

Line 295: equivalent volcano? This is unclear...re-phrase

Line 304: ...could be the product of MCS... (please explain the acronym and the meaning of this)

Line 309: paleo-ria???

Line 325: implies

Line 336: Evidence of...

Caption of Fig. 2: ...modified from and from...???

Caption of Fig. 3: indicate NB, BB, ...

Fig 6: please present uninterpreted and interpreted profiles, at a larger scale!

Caption of Fig. 8: there is a repetition of sentence (the seismic line shows.)

C4

Fig. 9: I do not see the location of this figure

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