

Reviewer #1

Overall, I found that the authors have a purely Alpine vision on what happened in the present-day so-called “Alpine Foreland”. Eventhough I may only partly agree with that, I have no problem with their preference in the interpretation of the Eocene ages since they now discuss more fairly alternative explanations (Eocene N-S “Pyrenean” compression). However, for an obscure reason, they do not want to really include the Oligocene extension in their tectonic evolution. **We thank the reviewer for this remind and we discussed the Oligocene extensional tectonics at lines 74-80 and we added it on Figures 7 and 8.**

Let me remind my earlier comment on this point:

Like the “Pyrenean” compression, the Oligocene extension related to ECRIS has been described in the Jura (Lacombe et al., 1993; Homberg et al., 2002) but is properly ignored in the evolutionary model proposed by the authors. Of course, if the authors have not sampled any normal faults, they could not date them. But this event should be considered in the regional tectonic evolution of figure 5, which should not report only “dated” tectonic phases at the risk of misleading readers unfamiliar with the regional geology. **We added the suggested references regarding the Oligocene extensional tectonics at lines 74-80 and we added the Oligocene extensional tectonics on Figure 7.**

If the authors want to link the Oligocene extension to their purely Alpine view of the Jura, I would suggest that they refer to the Merle and Michon 2001 BSGF paper for a possible model relating Oligocene extension to coeval onset of Alpine collision. But I urge the Authors to modify their sketches to fully account for this important event, the structural inheritance of which strongly influenced subsequent contractional evolution. **We added also the Merle and Michon 2001 BSGF reference at line 80. We modified all the sketches (see Figures 7 and 8).**

The sections of the present Figure 8 are also to me problematic in that the Alpine kinematics has changed through time, especially around 35 Ma (see Ford et al., Bellahsen et al.). That means that the orientation of the section should change accordingly to reflect the changing transport/shortening direction through time. This is not discussed at all and the sections still lack proper orientation. **We added proper orientations to the sections of Figure 8.**

I think that if these issues are fixed, and the figure and text adequately modified, the manuscript will be ready for publication. I confirm my feeling that the manuscript will be an important and useful milestone in the understanding the evolution of the Jura Mountains, and more generally of the Alpine foreland for which I congratulate the authors.

Olivier Lacombe

We thank the Reviewer for appreciating the paper and for his efforts on the revision. We hope that the new version of the manuscript satisfy the Reviewer.

Detailed comments

Figure 1. Add lat/lon coordinates. **Ok, added.**

Figure 1. Add vertical and horizontal scales. **Ok, added.**

Line 87. Lacombe and Mouthereau, 2002 should be cited here as well. **Ok, done.**

Line 93. Not really. See for instance Fig.7 in Lacombe and Mouthereau, 2002. **Ok, modified.**

Figure 2. Which one is the fault dated? The exact orientation of the fault dated must be highlighted even if it belongs to a dataset of faults of similar kinematics. **We highlighted in red the dated faults.**

Line 250. Missing quotation of Beaudoin et al. 2012 (reported in ref list) could be added here. **Ok, added.**

Line 292. Cannot understand the logic here. What is the MAXIMUM vertical stress? Tectonic burial would possibly lead to increase in vertical stress and on the contrary erosion would lower this vertical stress. So? **We agree and we modified this part.**

Figure 8. This figure lacks:

-orientation of the cross sections. **Ok, added.**

-in contrast with what the authors claim in their rebuttal, the Oligocene extension is not a minor phase which can be neglected (see for instance Lacombe and Angelier, Comptes Rendus Acad Sciences, 1993 and Radaideh and Mosar 2021 Tectonics paper. The occurrence of the Oligocene extension is fairly reported in Figure 7, but it must also be depicted in the time evolution of Figure 8. **We fully agree with the reviewer and we apologies for the little words spent for this tectonic phase. We modified Figure 7, including also the Oligocene extension in the time chart. In addition, we discussed the Oligocene extensional tectonic phase in the text at lines 74-80. Eventually, we modified Figure 8 adding e new panel with the Oligocene extensional tectonic phase.**