

Solid Earth Discuss., referee comment RC1  
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## **Comment on se-2021-46**

Thierry Dumont (Referee)

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Referee comment on "Chronology of thrust propagation from an updated tectono-sedimentary framework of the Miocene molasse (western Alps)" by Amir Kalifi et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-46-RC1>, 2021

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The topics of this manuscript is of major interest, since the Tertiary sedimentation allows to constrain the orogenic propagation in the Alpine foreland. The core of the manuscript consists of integration of new geochronological data (biostratigraphy, chemostratigraphy, magnetostratigraphy) with the existing database in a sequence stratigraphic framework, along with a synthesis of available well-log and seismic profiles. Besides this, the authors provide a reappraised structural framework based on existing maps, subsurface information from key seismic profiles, and field overview of some key areas. This reappraisal also benefits from some previously published field sections or even unpublished elements from the [geol-alp.com](http://geol-alp.com) website. These sedimentary and structural synthesis are correlated to propose a dynamic tectono-sedimentary and paleogeographic framework of the forward propagation of Alpine orogeny during Miocene.

This work is clearly worth of publication, provided it takes into consideration the comments listed below. The most reliable and solid input is the chronostratigraphical synthesis, and the important information brought by field sections and wells/profiles analysis. I have more reservations about the structural synthesis, which lacks kinematic data about brittle deformation (thrusts, faults), folds analysis, ductile deformation (Bornes) and transport directions, which also lacks 3D maps analysis, and which attempts anyway to conclude about stress evolution and chronology of thrusting. Thus, some conclusions appear overinterpreted, such as the complete allochtony of the northern Subalpine massifs, or the attribution of an Oligocene age to the earliest identified thrust (the paper is furthermore devoted to Miocene). From geodynamic point of view, the demonstration and time-space quantification of the forward propagation of the Alpine front since early-middle Miocene is convincing, although the geodynamic and structural inheritance and specificity of the Oligocene phase, along with older inherited structures (Hercynian trends), could have been better considered.

See the attached file for more specific comments and corrections required/suggested.

Please also note the supplement to this comment:

<https://se.copernicus.org/preprints/se-2021-46/se-2021-46-RC1-supplement.pdf>