

# ***Interactive comment on “Late Miocene thrusting in the North Alpine foreland: Driven by a deep-seated process and shaped by the local mechanical stratigraphy” by Samuel Mock et al.***

**Samuel Mock et al.**

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Dear Editor, dear Referee,

We thank the referee for his very detailed and constructive comments on the manuscript. The referee is an expert in the tectono-sedimentary evolution of the Molasse Basin, especially of the Bavarian and Austrian part. We are thus pleased to see that his overall verdict is very positive as expressed by the check list at the end of his review letter. The referee’s major point of criticism addresses the underrepresentation of: (1) The along-strike variation in the stratigraphy of the Bavarian Molasse and its influence on the tectonic evolution of the Subalpine Molasse; (2) The inherently different

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tectonic setting in the Eastern Alps, compared to the Central Alps.

Regarding point (1), we will duly take into account also the literature from the Bavarian Molasse in order to address the influence of the mechanical stratigraphy on the structural style in the Subalpine Molasse. As the referee has pointed out, there are a number of observations which have already been published on that topic, many of them by the referee himself, and we will gladly supplement our observations with the latter.

With respect to point (2), we are happy to implement the referee's suggestions and describe and discuss the inherently different tectonic setting of the Eastern Alps more carefully in the introduction and discussion part of the revised manuscript. However, we think that a major point which led to confusion, also with referee #2, is the fact that we use a definition for the terms Central and Eastern Alps which differs from the classical one (e.g. Schmid et al., 2004). We use a nomenclature which is based on paleogeographical and tectonic considerations but mainly, on the deep structure (i.e. slab geometries), which has been shown to be inherently different for the Central and the Eastern Alps, respectively. This definition has been proposed and promoted by Kissling and Schlunegger (2018) and Rosenberg et al. (2018) and shifts the Central-Eastern Alps boundary further east (approximately to the Brenner Fault). In the current manuscript, this has not been adequately described and we will add this information in the revised manuscript.

In general, we greatly acknowledge the referee's criticism and are happy to follow his suggestions to widen the introduction and discussion part. This gives us the great chance to truly upscale the manuscript and discuss our observations also in the context of a proposed subduction polarity change beneath the Eastern Alps and the observed escape tectonics in the latter.

Please see the attached revised manuscript with track changes, where we directly addressed the constructive and detailed comments and suggestions by the referee.

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With kind regards on behalf of the authors, Samuel Mock

#### References:

Kissling, E. and Schlunegger, F.: Rollback Orogeny Model for the Evolution of the Swiss Alps, *Tectonics*, 37(4), 1097–1115, doi:10.1002/2017TC004762, 2018.

Rosenberg, C. L., Schneider, S., Scharf, A., Bertrand, A., Hammerschmidt, K., Rabaute, A. and Brun, J.-P.: Relating collisional kinematics to exhumation processes in the Eastern Alps, *Earth-Science Rev.*, 176(October 2017), 311–344, doi:10.1016/j.earscirev.2017.10.013, 2018.

Schmid, S. M., Fügenschuh, B., Kissling, E. and Schuster, R.: Tectonic map and overall architecture of the Alpine orogen, *Eclogae Geol. Helv.*, 97(1), 93–117, doi:10.1007/s00015-004-1113-x, 2004.

Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2019-56/se-2019-56-AC1-supplement.pdf>

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Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-56>, 2019.

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