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Comment on se-2021-95

Uwe Kroner (Referee)

Referee comment on "Variscan structures and their control on latest to post-Variscan basin architecture: insights from the westernmost Bohemian Massif and southeastern Germany" by Hamed Fazlikhani et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-95-RC3>, 2021

Dear Hamed Fazlikhani and co-authors,

thanks for this stimulating manuscript. In terms of regional correlations, the analysis of the hidden basement architecture southwest of the Franconian Line is very important. Adjacent to the Münchberg klippe, traditionally the Variscan orogeny has been explained by exclusive NW-SE convergence. This cylindrical tectonic model based on the kinematics of the late Variscan shortening and the existence of SE dipping seismic reflections in the upper and middle crust in the Erzgebirge-Fichtelgebirge Zone (e.g., as visible in the NW-SE oriented seismic profile 9HR), If such an architecture is valid for the entire region than the NW-SE oriented seismic profiles southwest of the Franconian line should reveal a similar pattern. As documented in this study this not the case. The most prominent reflectors dip towards NE pointing to a more W / SW directed foreland tectonics. The paper is well organized, and the figures are of high quality. After minor-moderate revisions the manuscript is suitable to be published in Solid Earth.

Comments

- The Geological setting needs a concise review regarding the loads of tectonometamorphic constraints published in the last years (see for this the recent publications of Hallas et al. 2021 and Schönig et al. 2020 and references therein).
- For example, the Fichtelgebirge constitutes the footwall of the Münchberg Massif but the hanging wall of Variscan high pressure nappes inside the Erzgebirge Fichtelgebirge Zone. By no means the lithologies of the Fichtelgebirge constitutes autochthonous units of the Saxothuringian Zone as sketched in figure 1.

- Saxothuringian Basement is not an appropriate term for the Basement Seismic Facies - BSF3. The Saxothuringian basement encompasses various nappes (BSF1), shear zones (BSF2) and the Cadomian basement plus early Paleozoic overstep sequences of the Autochthonous Domain (sensu Kroner et al. 2007). Therefore BSF1-3 constitutes Saxothuringian Basement.

- If you correlate BSF3 with lithologies of the Autochthonous Domain (why not) than a remarkable result of your study is the occurrence of BSF3 just SW of the Fichtelgebirge as evidenced in figure 8, i.e., the interpretation of the NW-SE seismic profile FRANKEN-1803. Please discuss the possible occurrence of the Autochthonous Domain SW of the Fichtelgebirge.
- In your 3D sketches of Figure 11 you propose a generally W-directed tectonic transport which deviates at least 45° from the classical late Variscan (N)NW shortening (Wurm 1926, Stephan et al. 2016). Do you mean with this direction the initial W(SW) nappe stacking or the finite displacement the entire stack?

References:

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