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Solid Earth
Discussions

Interactive comment on "The formation of North-South Seismic Zone and Emeishan large igneous province in Western China: Insight from teleseismic tomography" *by* Chuansong He

Irene Bianchi (Referee)

irene.bianchi@univie.ac.at

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This study presents a teleseismic tomography of the North-South Seismic Zone in the eastern part of China, a region of high seismic hazard. The results illustrate the presence of a plate-like high velocity anomaly (at 400-500 km depth) and two low velocity anomalies (at 50-200 km depth) which are interpreted in terms of asthenosphere upwelling and absence of a rigid lithosphere.

The manuscript submitted by C. He presents several relevant issues. First of all, and most important, there are already 5 publications of this author on the same area (approximately LON: 96-112E and LAT 26-40N) and with the same applied methodology

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(teleseismic tomography). I looked inside all these previous publications and found out that in this manuscript: (a) the investigated area overlaps about 80% with the area investigated in the previous papers; (b) few more stations (<30%) and (c) few more data (about 5%) have been added with respect to previous works. All these aspects have been totally overlooked by the author, in particular, the Data and Methods section did not mention if any of the used teleseismic data has been previously analyzed in the former studies. But, comparing the teleseismic distribution presented in Figure S1 with the event distribution shown in other papers (He et al., 2019, Figure 1 inset), it is clear that same set of data have been used (easy to recognize looking to the few events occurred in Europe). The author should have mentioned carefully the need of a further teleseismic tomography of the same region. The tomographic model presented here is the same tomographic model presented in the previous work (i.e. He et al., 2019), where the higher detail of the presented model might be due just to the higher damping value used in the current (submitted) version. In the presented figures, similar depth slices and same depth profiles as the previous work are shown, they carry a higher detail, which is not justifiable by the increased amount of data (just +5%) or increased amount of stations (due to the fact that the larger number of stations is given by the enlargement of the study area towards the South). Moreover, when previous work of the same author on the same area and with the same methodology exists, the good practice and the rigorous scientific method, impose to clearly and exactly state what are the differences that the current version of the work presents with respect to the previous work and the improvements need to be highlighted. In the actually submitted version of the manuscript this is lacking, and therefore this work wants to appear as completely new, while it is a replica of the many previous works of the same author. Such practice, which unfortunately is becoming diffuse in the scientific community has to be stopped.

The previous papers which I am referring (listed also in the references of the manuscript) are the following:

He, C. S., and Santosh, M.: Crustal evolution and metallogeny in relation to mantle dynamics: A perspective from P-wave tomography of the South China Block, Lithos, 263, 3-14, https://doi.org/10.1016/j.lithos.2016.06.021, 2016.

He, C. S., and Santosh, M.: Mantle roots of the Emeishan plume: An evaluation based on teleseismic P-wave tomography, Solid Earth, 8, 1141-1151, https://doi.org/10.5194/se-2017-17, 2017.

He, C. S., and Santosh, M.: Intraplate earthquakes and their link with mantle dynamics: 457 Insights from P-wave teleseismic tomography along the northern part of the North–South Tectonic Zone in China, C. R. Geosci., 349, 96-105,24 https://doi.org/10.1016/j.crte.2017.04.002, 2017.

He, C. S., Santosh, M., and Yang, Q. Y.: Metallogeny linked to mantle dynamics in the Sanjiang Tethys region as inferred from P-wave teleseismic tomographic study, Ore Geol. Rev., 90, 1032-1041, https://doi.org/10.1016/j.oregeorev.2016.10.018, 2017.

He, C. S., and Zheng, Y. F.: Seismic evidence for the absence of deeply subducted continental slabs in the lower lithosphere beneath the Central Orogenic Belt of China, Tectonophysics, 723, 178-189, https://doi.org/10.1016/j.tecto.2017.12.018, 466 2018.

He, C. S., Dong, S. W., and Wang, Y. H.: Lithospheric delamination and upwelling asthenosphere in the Longmenshan area: insight from a teleseismic P-wave tomography, Sci. Rep., 9, 6967, https://doi.org/10.1038/s41598-019-43476-0, 2019.

Other issues of this work include the following:

The methodology section is synthetic and does not allow evaluating the quality of the work. The author refers to previous publications about the methodology and lists them, but does not illustrate the steps done for obtaining the tomographic images. More details on the methodology are needed in order to evaluate this work.

âĂĺIt is not clear what is the reference velocity for the tomography images, the colorscale in the figures shows a dVp velocity anomaly, but does not say with respect to

which values, which instead is critical for understanding the meaning of the perturbations. The labels in the figures are too small to be read (300% zoom is needed to read the labels).

Concerning the data, it is not specified which network was operating simultaneously with the other. 585 teleseimic earthquakes have been used, but it's not described which of the 5 networks has recorded them, simply a list of the networks used and when they were operating is given in the manuscript.

The resolution tests shown in the supplementary material are not meaningful. According to these, the model retains the same resolution at 50 as well as at 800 km depth (I mean that the resolution is all the same between 50 and 800 km depth). I cannot understand how this is possible. The teleseismic rays are crossing the medium beneath the station with different spacing at the different depth, therefore this makes me think that the checkerboard tests show an unrealistic resolution.

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