

## Comment on se-2021-129

Anonymous Referee #1

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Referee comment on "Whole-rock and zircon evidence for evolution of the Late Jurassic high-Sr/Y Zhoujiapuzi granite, Liaodong Peninsula, North China Craton" by Renyu Zeng et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-129-RC1>, 2022

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The manuscript by Zeng et al presents new geochemical data, zircon U-Pb-Hf isotopes and zircon trace element concentrations for the Jurassic high Sr/Y granites from the Liaodong Peninsula, North China Craton. According to the authors, the granites were I-type rocks and formed at the ages of ~158-162 Ma. Their primary magma was derived from partial melting of metagneous rocks which have composition similar to the areal Precambrian high Sr/Y granites, and subsequently experienced a two-stage magmatic evolution as revealed by the chemical zones of zircons. Overall, the data quality is high and valuable and the manuscript is generally well organized. The finding of zoned zircons is also enlightening and would provide new approach to study the petrogenesis of the granites from the NCC. Nevertheless, there still have several weaknesses in the manuscript, and I would suggest a moderate revision before it could be published.

1) The major criticism to the manuscript is about the tectonic implications, which is confusing and seems to have weak connection with the conclusion of this manuscript. The tectonic setting of the Late Jurassic granites given by the authors is unclear. In line 402-403, it is suggested that the Late Jurassic magmatism in Liaodong is related to the thinning of the NCC mantle lithosphere, which means an extensional setting since the thinning of lithosphere often occurs in this setting. Whereas, in line 421, the authors give a compressional environment for those Late Jurassic granites, which is opposite to the previous statement. In fact, the occurrence of I-type granites cannot be used to constrain the tectonic setting. Besides, the authors proposed a mature continental arc setting for the Late Jurassic rocks, which I guess might be one of the implications of this work for the tectonic evolution of the NCC. However, the arguments for this implication are not well given and more discussion is needed.

2) The  $^{206}\text{Pb}/^{238}\text{U}$  ages for the ESR and LSR are undistinguished within the analytical error. The authors are not suggested to use these age data to discuss the different crystallization stages for the zoned zircons. In line 222-226, the dispersion of age data for zircon grains from the same sample are used to indicate the cooling rate of magma. What is the rationale? How to build the connection between the U-Pb isotopic variation to the cooling rate of magma? Please give more discussion about this linkage.

3) Except for the Liaohe Group, a lot of Precambrian granitic intrusions and mafic dikes/sills were also exposed in the Liaodong Peninsula, which are suggested to be included in the section of geological setting.

4) Please give the standard reference materials used in the dating and Hf isotope analyzing and their analytical results, which is important for readers to evaluate the data quality.

Specific comments:

Line 170: please add the range of U concentration for high-U zircons as well as the cited reference.

Line 395: the citation should be 'Yang et al., 2015a' and the intrusion should be 'Wulong granite'. Sanguliu granites were formed in early Cretaceous.

Figure:

The depiction for some figures is too simple, like Fig 13, 14, which is a bit odd.

Figure 1: Please check the word spelling in a), e.g., 'SOUTH CHINA CRATON" and "CENTAL ASIAN OROGENIC BELT".

Figure 12: Please check the orientation of arrows in different diagrams and give what process the arrow refer to.

Figure 14: Please give the meaning of the arrows in different diagrams.