

Interactive comment on “Kinematics of subduction in the Ibero-Armorican arc constrained by 3D microstructural analysis of garnet and pseudomorphed lawsonite porphyroblasts from Ile de Groix (Variscan belt)” by Domingo Aerden et al.

Anonymous Referee #2

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The manuscript present microstructural data on FIA of different lithologies from Ile de Groix. The manuscript contributes to the important debate around the interpretation of fabrics in metamorphic terranes. Assuming theoretical assumptions behind FIA technique, the authors elaborate an alternative interpretation of micro-/ mesostructures, upscaling their findings to the tectonic paleogeography during variscan orogeny.

While the manuscript is well written and appealing in many ways, I have some concerns about it. Methodology is confusing, dispersed or even not explained. The expectations created for the use of microtomography are blurred by the lack of experimen-

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tal/processing information (e.g. acquisition conditions, voxel size/resolution, applied filters before and after back-projection reconstruction, segmentation procedure, phase indexing/labeling etc). Reference system should be stated very early, as the way orientation of features was obtained from the stack. The technique is underused, after a correct experiment and segmentation, quantitative shape fabric analysis could be conducted with FIJI or similar softwares like Blob3D. Only BoneJ is declared, but it is not clear the way the authors have reached the results from that plugins!

On the other hand FIA technique have to be explained and/or better illustrated in methods. It is a quite specialized method for an average SE reader. I have included several comments across the manuscript, but reorganization is required. There is a mixture of results and interpretations that should be avoided. The reader does not need to be conducted into a conclusion but has to be able to easily understand how the dataset were collected and elaborated, how the results confront/correlate with previous datasets (e.g. quartz CPO, fold analyses, P-T trends...), and explore/judge the arguments in the discussion. In some cases the interpretation is too speculative considering the scale of observation and the number of measurements. Beside, previous datasets have not been well integrated into the discussion (e.g. qtz CPO, Metamorphism).

Overall the manuscript needs work to be done before publishing in SE. Some thin sections are still missing (see author note), the methodology must be reorganized and completed, and results and interpretation clearly separated. Integration of FIA data and previous microstructural data needs to be done in the discussion. This would result into a better support for conclusions and upscale interpretations. I hope my comments helps to improve this stimulating research!

Please also note the supplement to this comment:

<https://se.copernicus.org/preprints/se-2020-175/se-2020-175-RC2-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-175>, 2020.

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