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Interactive comment on "High stresses stored in fault zones: example of the Nojima fault (Japan)" *by* Anne-Marie Boullier et al.

Anonymous Referee #2

Received and published: 11 January 2018

The manuscript entitled 'High stresses stored in fault zones : example of the Nojima fault (Japan)' is aiming at answering an interesting and important question about the maximal lateral distance from the fault plane and maximal depth for dynamic damage to be imprinted in rocks, by means of measuring the residual stress and microstructural features of a specimen of granodiorite located at 51.3 m from the Nojima fault (Japan) that was drilled after the Hyogo-ken Nanbu (Kobe) earthquake, taking advantage of the state-of-the-art materials characterization techniques, such as high resolution X-ray Laue microdiffraction and EBSD.

The results are solid, while the following questions need to be answered:

1. "Residual stresses are calculated from elastic strain measured by X-ray Laue microdiffraction and stress peaks at 100 MPa (mean 141 MPa)." In fact the "residual

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[Discussion paper]

stress" should be explained and discussed in several aspects. It should be emphasized that the measured strain was actually deviatoric strain tensor, but the full strain tensor. Therefore, the stress tensor calculated was neither full stress tensor nor deviatoric stress tensor, and thus the so-called von Mises stress is not the real von Mises stress. How different could it be? A discussion would be appreciated.

2. Quartz has trigonal symmetry, which leads to some possible ambiguity for the Laue pattern indexing, as shown in some reference papers, for example Journal of Applied Crystallography, 45, 982-989, DOI: 10.1107/S0021889812031287, 2012. Thus more details about how LaueTools handle such problem are welcome.

3. Page 16. "Indeed, although in theory a multi-grain indexation procedure could be applied to the multi-spot Laue pattern, in order to individually index each sub-spot present on the beam path, in practice the corresponding code for closely-spaced sub-spots is still unavailable." This is not real. The code is available and practical in many Laue data analysis software packages.

4. Page 26. "especially the [02-22] spot". Square brackets are improper.

Interactive comment on Solid Earth Discuss., https://doi.org/10.5194/se-2017-130, 2017.