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Solid Earth Discussions

Interactive comment on "Synchrotron FTIR imaging of OH in quartz mylonites" *by* Andreas K. Kronenberg et al.

Anonymous Referee #2

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This manuscript presents a very detailed and comprehensive study aiming at relating the OH content in quartz mylonites to the microstructure. The most attractive part of the paper is clearly the OH maps superimposed to the microstructure. Also, the authors have pushed the limits of analysis to detect quite low water contents with a spatial resolution of about 10 μm.

This is mostly an analytical work and the authors clearly have the will to do it well and to convince the reader of their care. I have the greatest respect for that, since the quality of the data is of primary importance in science. However, the drawback is that the paper is very long. The abstract itself is nearly two printed pages long, containing very general statements ("synchrotron IR radiation is brighter. . .") which should not be placed here. Besides lengthy description of technical details, the paper contains many repetitions. I have no objection for the paper being published as it is since this is not

wrong, but I really think that the exposure of the work would be far better if the paper would be strongly re-written to be much shorter in order to get readily to the point (with possibly all technical details gathered in a "Methods" supplement).

It may be a small detail also, but I am not sure that the choice of cool colours for high water content is the most appropriate since one is used to look for "hot spots" in warm colours. The colour scale chosen is however clearly indicated and the reader has all information needed to correctly interpret the figures.

Now, what is the point of this paper ? High resolution maps of water content in relation to microstructure is found to be complex and heterogeneous. The link between ductility and water content does not appear simple and systematic. However, the authors recognize, that evidences for water contents are always larger the than solubility, and they highlight the usual impression that the history of water uptake through microcraking is pervasive. This confirms that water weakening must be a dynamic process and that looking, far from equilibrium, for a simple relationship between plastic strain (which is not a state variable) and water content (the evaluation of which might be biased by continuous changes) might be a concept to abandon.

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