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Interactive comment on "Experimental deformation and recrystallization of olivine – processes and time scales of damage healing during postseismic relaxation at mantle depths" *by* C. A. Trepmann et al.

Anonymous Referee #2

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Sec. 2.1 p. 468 lines 10-14 -convert piston velocity to strain rate

p.471 line 14 - stress is uncertain so explain why "a reduction in strength from the first to the second deformation stage can be excluded"?

p. 472 lines 8-9 - it is a misnomer to refer to crushed grains as "recrystallized" and ultimately confuses the terminology, however, this usage is sufficiently explained later in the text to allow it. I would prefer that this be made a little clearer earlier in the text however.

There are additional minor corrections that should be discovered during normal proof reading prior to submission of the final manuscript.

The major contribution of this paper is the excellent documentation of a sequence of brittle deformation followed by a period of grain growth that produces microstructures that could be mistaken in natural rocks for dynamic recrystallization. The only distinction being that one would anticipate development of a crystallographic preferred orientation in the case of high strain deformation accommodated by dislocation processes. This points to the importance of deformation path or history and the possibility of different sequences of deformation mechanisms producing similar microstructures. Overall the approach is very good and well documented and should provide a useful tool for field geologists evaluating deformation mode from micro structural observations of natural rocks.

Interactive comment on Solid Earth Discuss., 5, 463, 2013.