

Anonymous Referee #1

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The manuscript by Quintanilla-Terminel et al. focuses on the techniques to quantify small-scale strain during deformation of geo-materials. The authors present numerous examples of imposing surface markers using lithographical techniques to the samples that undergo high-temperature deformation. They are succeeded in detecting nano- to micro-scale strain in calcite and olivine aggregates from deformation of the markers. Such a fine scale strain analysis indeed helps our extrapolation of experimental results to nature which are quite different in scales of time, grain size, pressure and so on. The paper is very technical and many details are supplied that will help others who want to follow the complex technique of strain mapping. I recommend publishing with minor modifications.

25. “ionic” should be ”atomic”?, since the material is not necessarily ionic materials here.

[Changed in text.](#)

50. I recommend the author to reconstruct this section of 2. I think the title of section of 2.4 can be as “General procedures of lithography to geomaterials”. If that is the case, then I recommend the author to bring this section before the section of 2.2.

The contents of 2.2 and 2.3 are examples of applications of the techniques that are explained at the beginning of this section 2.

Perhaps, the title of "2.1 Lithography" can be removed. The content of 2.1 is a general overview of lithographic techniques such that 2.1 can start from "Photolithography".

[We have re-written this section. Thank you for the suggestion!](#)