

Interactive comment on “Calculating structural and geometrical parameters by laboratory experiments and X-Ray microtomography: a comparative study applied to a limestone sample” by L. Luquot et al.

Anonymous Referee #2

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Thank you very much for your contribution to the Journal “Solid Earth”. The topic of the paper is very interesting in the sense that the new applicability of analysis using X-ray CT images is indicated. Basically the article is suitable for the journal, however, I still have some questions and comments. I am very glad if you refer the following comments.

p.12, l4 As for equation (9), several parameters are shown, however, definition of G_x has not been indicated yet.

C1911

p.12, Section “Evaluating errors on porosity calculation” It is important to discuss about the errors of some properties obtained from CT images. However, the explanation in the paper sounds vagueness. Can you indicate or describe concrete methods or procedures?

p.15, l16 It is mentioned that the reason of porosity change is due to the connection of initial non-connected pores. Is it possible to identify those pores from CT imaged? Actually pore networks are shown in Figure 5. However, this is after dissolution tests and it might be better if you can show the difference before and after dissolution tests visually. Personally I think it is the biggest advantage to use X-ray CT.

p.18, l14~20 You have discussed the relation between the threshold value and accuracy of the results. However, errors or accuracy of the result strongly depends on the distribution of gray scale value frequency. For example, if the threshold value is set where frequency is small, the error becomes small since the difference of threshold value does not influence the number of voxels against total voxels very much. In order to generalize as you mentioned in the paper, it is necessary to discuss the quality of the gray scale value frequency.

p.19, l13 You mentioned that visualizing 3D images make it possible to evaluate the effect of wormholes. It is reasonable, however, isn't it possible to show some examples of CT images which show the existence of wormholes?

Figure.8 Two main groups of lines (results) are indicated in Figure 8. However, it is impossible to identify which is which from the graph legend. Please show the differences by other method.

p.24, l10 ~ 15 It is mentioned that you could extract both pore and throat distribution. Actually pore distribution is shown in Figure 5, however, is it possible to identify the throat distribution from this figure? Have you discussed how to extract the information about throat?

C1912

General comments You indicated the various kinds of results in this paper. Some of them are evaluated XMT images. I think you should show more images in order for readers to understand the structures or geometry of samples.

Interactive comment on Solid Earth Discuss., 7, 3293, 2015.

C1913