Solid Earth Discuss.,
doi:10.5194/se-2016-43-RC1, 2016

Solid Earth Discussions
Open Access
EGU

Interactive comment on "X-ray Computed Tomography Investigation of Structures in Opalinus Clay from Large Scale to Small Scale after Mechanical Testing" *by* Annette Kaufhold et al.

W. Graesle (Referee)

werner.graesle@bgr.de

Received and published: 29 March 2016

The application of non-destructive X-ray CT techniques for the investigation of geomaterials has become quite common during the last years. Despite the huge number of papers published on this topic, the manuscript appears to be quite unique with respect to the combination of CT techniques on very different scales in a systematic top-down approach (also including additional imaging techniques such as ESEM). The structure of the manuscript is reasonable by simply reproducing the steps of different scale CT-investigations following the top-down order. Overall, this results in an impres-

Printer-friendly version

Discussion paper

sive demonstration of the prospects and advantages that CT techniques can provide in the field of rock physics. Applying all investigation techniques to a single core sample which has been subjected to a triaxial strength test adds to the explanatory power of the investigation, because the origin of the analyzed features (shear plane and disking planes) is already well known.

Some minor shortcomings of this manuscript are to be addressed. Most of them will be recovered easily within the process of manuscript revision. In particular, three issues have to be mentioned:

- The results of extensive mineralogical and geochemical investigations are presented. But compared to the excellent combination of results from various CT and imaging techniques into a “synergetic” interpretation yielding a convincing general view, only minor use of the mineralogical and geochemical results has been made in the interpretation.

- The presentation of mechanical processes deserves some improvement, particularly with respect to the discrimination of different failure modes.

- The discussion of features observable in images and 3D data sets is very convincing on the level of qualitative description. In contrast, when attempts are made to derive quantifiable parameters from those data sets, the applied methods are not explained sufficiently and remain somewhat nebulous or even ill-defined. Although those quantifiable parameters only play a minor role in the manuscript, some improvement is recommended.

A detailed listing of various questions and suggestions is added as a supplement (pdf-file)

Please also note the supplement to this comment:
http://www.solid-earth-discuss.net/se-2016-43/se-2016-43-RC1-supplement.pdf

Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-43, 2016.

Printer-friendly version

Discussion paper