

Interactive comment on “On the path to the digital rock physics of gas hydrate bearing sediments – processing of in-situ synchrotron-tomography data” by Kathleen Sell et al.

Anonymous Referee #1

Received and published: 13 April 2016

This study claims a post-processing procedure for the synchrotron tomographic data, involving the density contrast enhancement, as well as 2D and 3D phase rendering and segmentation; of particular interest is their application in the physical parameters simulation with the help of the derived results. Various filters for the image enhancement are illustrated and compared, which depicts a rather beautiful picture of the differences among them, and thus would help a lot for the readers to figure out a proper one. This will contribute considerably to the following studies. Volume rendering is always an ambiguous issue in 3D image processing, particularly in studies on gas hydrate where low density contrast phases such as water and hydrates are frequently present. The method introduced here by a combination of watershed algorithm and a region growing

C1

technique appears practical, yet still some problems remain, like the effect of signal-noise ratio on the accuracy of the region growing method. The simulation of physical properties through the digital rock data is a quite interesting topic, which could on one hand predict what is difficult to measure, and also explain the overall property from a much more microscopic angle of view on the other hand. The velocity of P-wave propagation in sediments is shown and further calculation on conductivity (thermal, hydraulic, electrical) or mechanical strength could likely be expected as well. Overall, this study is worth a positive comment, from which I believe the readership will benefit a lot.

Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-54, 2016.

C2