Image processing & advanced characterization of 3D FIB-SEM Reconstructions with Avizo & Amira

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Nanoscale structures revealed by FIBSEM imaging are of increasing importance for research in fields ranging from sedimentary rocks to tissue-engineering. In recent years, the significant development of FIBSEM technology has allowed us the opportunity to achieve unprecedentedly high nano-scale resolution on a variety of materials. As a result, accurate quantification is now an attainable goal. However, it is still a significant challenge to define high accuracy at these high resolutions.

While mathematical theory for software analysis has been around for some time, sophisticated image pre-processing is in higher demand than ever before. The purpose of image pre-processing is to decrease or clarify the artifacts in the image, caused during Image acquisition as we analyze high resolution, high contrast, high signal fidelity and high spatial fidelity. We will discuss a set of different techniques to pre-process the raw images from the FIBSEM to enhance the ability to perform accurate quantification with Avizo & Amira software.