The expected input data for this recipe is a 3D FIB-SEM stack. This recipe is optimized for rock data especially carbonate rich samples such as chalks, marls and marly shales. The resolution of the data is in itself not important so long as the porosity and other phases of interest are fully resolved.

EF\_FIBSEM\_Filtered image specifications:

3D Image, Grayscale

Type: 8-bit unsigned

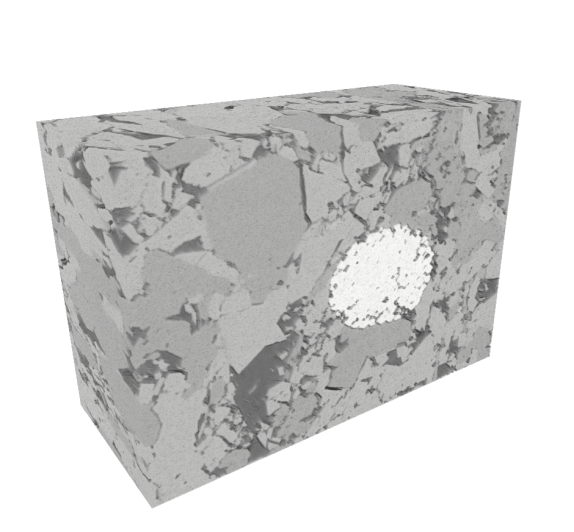
X: 10nm

Y: 10nm

Z: 20nm

Image Resolution: 1425x987x300

This data set has been filtered and aligned previously.



Running the recipe:

In the recipe panel:

Select EF\_FIBSEM\_Filtered as the input data. The 3 initial steps of the recipe contain breakpoints that allow you to skip or adjust the parameters at each step. With the example data set these steps may be skipped as filtering and alignment have been completed. However, when applied to external data sets these steps are necessary to achieve a quality result.



Once the filtering and alignment are complete, steps to further process and segment the data are included in the recipe. Key steps that need to be adjusted for external data have been selected for break points.

These steps in order are:

1. Thresholding the full image as a mask
2. Block Face Correction (slice based intensity correction)
3. Image Gradient 3D
   1. to be used as a materials boundary and for watershed
4. convert image type
   1. converts gradient image into correct format for watershed segmentation
5. Selecting pores
6. Selecting pore boundaries
7. Selecting organic Material
8. Selecting porebacks and grain boundaries
9. Selecting quartz grains
10. Remove Small Spots
11. Selecting calcite grains
12. Removing Small Spots
13. 2D Marker-Based Watershed
    1. to capture porebacks
14. Selecting high-z
15. 3D Marker-Based watershed
    1. Pores and OM seeds are from 2D watershed

The expected output is a 5-phase label image for use in the analysis and explore workspace. (see below)

