FEI™

MAPS

Navigate, Tile, Stitch, Correlate and Analyse Data

MAPS is software for automated acquisition of high resolution images from large areas. MAPS enables the navigation, tiling, stitching, correlation and analysis of image data. An easy-to-use, modular and expandable software application, MAPS consists of a base module called Tiling & Stitching. The optional module MAPS Correlative enables integration and incorporation of images acquired on other systems. MAPS enhances the imaging acquisition and analysis capabilities of any SEM or DualBeam™ instrument.

Data acquisition, storage and viewing is managed by MAPS in Projects. Within a Project, execution of activities can be continued after interruption and new activities can be added at any time, for example the additions of a new region of interest for more detailed image acquisition or a new layer for further processing.

MAPS Tiling & Stitching

Automated imaging of large areas is a core feature of MAPS. The area of interest is divided in multiple tiles which are recorded in a sequence and subsequently stitched to one single image. The size of the area is limited by the size of the stage rather than the image acquisition hardware. As a result, high resolution images of gigapixel size can be acquired. Another benefit of dividing a large area in multiple tiles is an improvement of overall image quality. To acquire data from a single large area at high resolution would take too much time, resulting in image quality loss due to stability and drift issues inherent in any system. With Tiling & Stitching, drift is kept to a minimum because the acquisition of data of every tile can be done much faster, leading to to higher quality results.

MAPS uses real-time acquisition of tiles with a small pixel size that have a programmable overlap. Dividing the area into smaller tiles has two important advantages:
- Image distortions are kept to a minimum reducing the need for post-processing and improving the image quality
- Acquired data is immediately available for review and further processing

Individual tiles are stitched by MAPS to create an overview of the sample as one big image using FEI's Smart \ Stitching algorithms. The system is configured to start the stitching process during image acquisition. Stitching accuracy is constantly monitored and in the unlikely event that the stitching quality confidence level is low, the software will highlight the issue enabling the user to do a manual alignment. Images can be stored in RAW, Tiff or HD View compatible format.

Key Benefits
- Automated data acquisition
- Tiling and Stitching
- Camera navigation
- Flexible focus options
- Project-based workflow
- Layered data organisation
- Works with all detectors
- Works between systems

MAPS Correlative

MAPS Correlative is an option for MAPS Tiling & Stitching. MAPS Correlative allows external images to be loaded for correlation with other types of images. Correlative navigation of external images is enabled through a two-point alignment method. Colored images produced using a specific threshold on the data can be overlaid on the original images and correlated to provide region specific information on the sample.

System requirements

Depending on the actual size and number of images collected, a considerable amount of processing memory and storage space is required for proper operation. It is therefore recommended to have at least 8 GB of RAM available. Additional hard-disk drives or network data storage space may be required for storage of images.
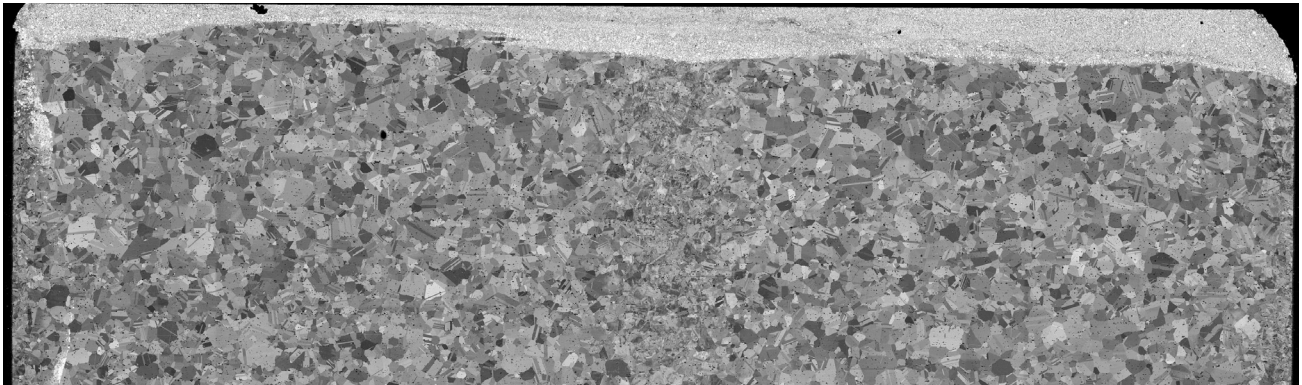

Stitched result of polished steel image tiles
Backscatter image of a 4 x 10 mm block of polished austenitic steel at a landing energy of 10 keV. After stitching, this resulted in an image of about 21,000 x 8,000 pixels. The image has been created by creating 12 rows of 23 images covering the whole sample. The size of each tile was 1024 x 884 pixels.
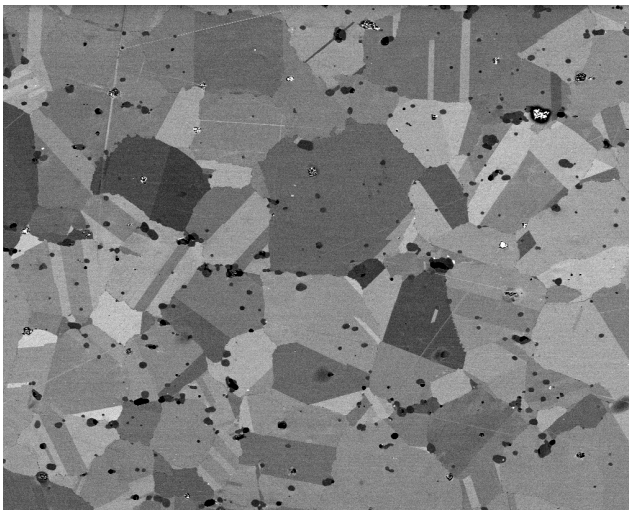
Tile example
One of the tiles, that has been used to compose the large image of polished steel.
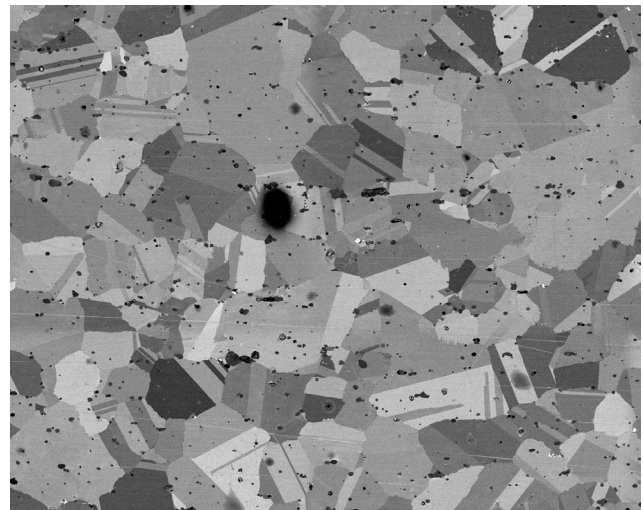
Zoomed in result
From the full overview of the stitched image of a sample, zooming exposes the high resolution details that are available which facilitate to locate interesting regions of interest for further exploration and investigation.

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