Acquire STEM Rotated Series

DigitalMicrograph plugin

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1 What this plugin is doing?

The plugin facilitates acquisition of STEM images with periodic alternating the fast scan direction:

- image in the initial orientation
- same image in the 90° rotated orientation
- next image in the initial orientation
- next image in the 90° rotated orientation
- and so on.

Revolving the direction of fast scan can offer significant benefits as the directions of maximal and minimal distortions are altered. Therefore, it is possible to reconstruct the accurate, undistorted structure by combining two images with mutually perpendicular fast scan directions.

2 Requirement

- Gatan Microscope Suite (GMS) installed in a (S)TEM-control PC
- Digiscan activated

3 Installation

- Download and unzip `temDM STEM_2_images_1_X.zip`.

Variant A

- Place `temDM STEM_2_images.gtk` into one of plugins folders of DigitalMicrograph.

  The script *find plugins folders.s* included in the distribution package will help you to localize such folders. Open *find plugins folders.s* in DigitalMicrograpgh and run it by pressing „execute“ or by pressing ENTER with holding the CNTR key. Read the list of available plugins folders. The first folder in the list is most appropriated for placing the temDM plugins.

- Restart DigitalMicrograph.
- Find item "STEM 2 images" in the "temDM" menu of DigitalMicrograph.

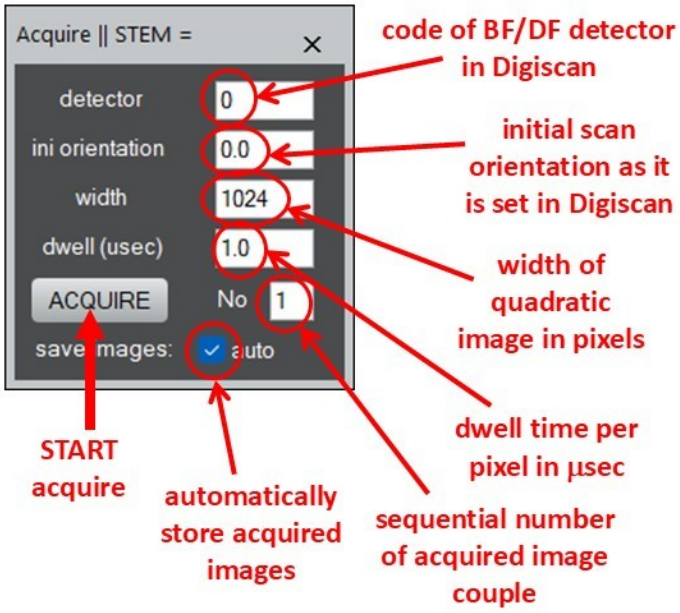
Variant B

- Open `STEM_2_images.s` in DigitalMicrograph.
- Press "Execute" button in the script frame.

Variant C

- Open `STEM_2_images.s` in DigitalMicrograph.
- Having `STEM_2_images.s` frontmost got to DigitalMicrograph Menu "File : Install script". Choose "Library" panel and press OK.

4 How it works



Before starting, check if the detector code, scan orientation (in degrees) and dwell time in the script frame correspond to those you typically use in Digiscan. Set the desired image size in pixels. This script supports acquisition of *quadratic* images only. Then:

- Find the appropriated place in the sample, focus image and press "ACQUIRE".
- Digiscan will acquire a STEM image, then will immediately rotate the fast scan direction 90° clockwise and acquires its copy in rotated orientation. The sequential image counter increments by one.
- Both images are displayed and automatically stored in the subfolder *rotated series* under the names `1_0.dm4` and `1_R.dm4`. The automatic save can be disabled via the checkbox in the frame. You can also change the folder name and standard names of images in the text of the script if you want.
- Go to another place in the sample, focus, press again "ACQUIRE" and get `2_0.dm4` and `2_R.dm4`.
- And so on...