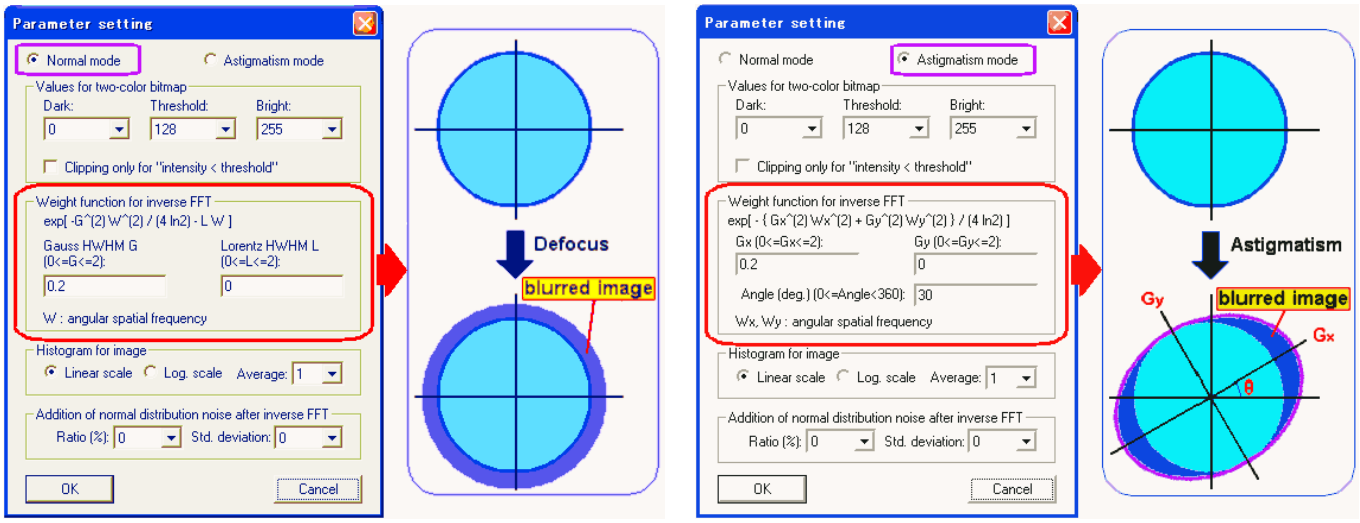
Convolution of SEM Image [X]

$ Introduction

The convolution of an SEM image (*1) and a circular (or, elliptic) profile beam is executed so that a blurred image without astigmatism (or, with astigmatism) is formed.
(*1): 8 bits grayscale bitmap, or, 16/8 bits grayscale tiff, with un-compressed format



$ Functions

Sets parameters.

Opens an image file (8 bits grayscale bitmap, or, 16/8 bits grayscale tiff).

Changes the opened image to a two-color image (8 bits).

Executes the convolution to the image.

Copies the processed image to the Clipboard.

Saves the processed image with a filename.

Changes the brightness and/or the contrast of the image.

Shows the version information.

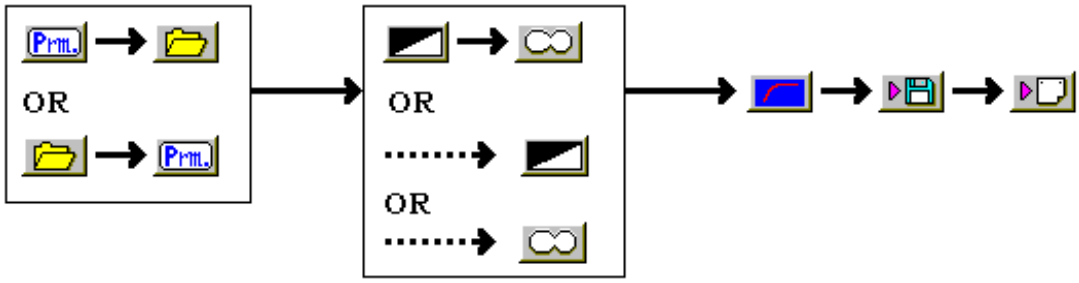
(This file.)

Closes this application software.

$ Images to be processed

Regarding SEM images, prepare bitmap images with un-compressed 8 bits grayscales, or, tiff images with un-compressed 16/8 bits grayscales.
[SEM image size N x M: 64 <= N, M]

$ How to Use



1. Set evaluation parameters by Prm. button.
2. Open an SEM image (which satisfies the above requirement) by button.
3. Make a two-color image by button.
4. Make a blurred image (with astigmatism) by button.
5. Change the brightness and/or the contrast of the image by button, if necessary.
6. Save the processed image by button.
7. Copy the processed image to the Clipboard by button, if necessary.

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Note: The image is not automatically saved.
Please use the “save button” for saving the processed image.
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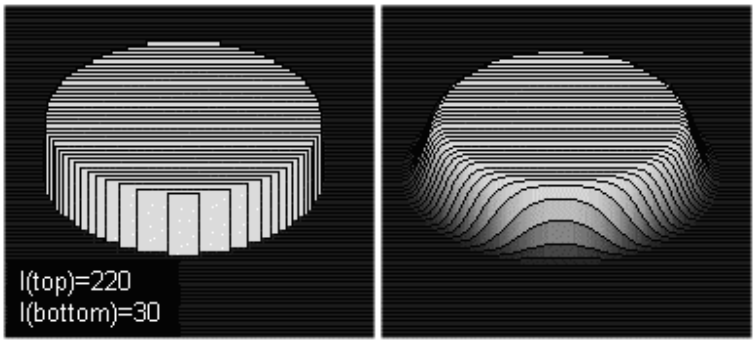
$ Supplement

The following is an example of the result obtained by the application software.



Note: Regarding a two-color image (8 bits) to be convoluted, the intensity of the top surface < 255, and the intensity of the bottom surface > 0.

When executing the convolution to the particles (in an image), having (perfect) cylindrical shapes, by using the 3D Gaussian function, the theoretical image resolution of the blurred image is considered to be $\sigma \times \alpha$, where σ is the standard deviation of the 3D Gaussian function, and α is a constant.
I think this is a good idea to estimate the image resolution. But, there are still discussions how to theoretically decide the official value of α (constant).