Quick Reference Guide

The MSA Main Menu

The commands in the MSA menu are described below.

Command	Description
Weighted PCA (see sub menus)	Executes wPCA methods.
Local wPCA (see sub menus)	Executes Spectral/Spatial Local wPCA methods.
Import (see sub menus)	Imports an SI data from different software or acquisition systems.
Bin SI	Bins an SI data spectrally and/or spatially.
Spatial Sub SI	Extracts SI data spatially specified by a rectangular ROI
Spectral Sub SI	Extracts SI data spectrally specified by a range ROI.
Remove Spike Noise…	Removes extremely sharp noise from each spectrum in SI data
Extract Component(s) (see sub menus)	Extracts a single or all component data from a stacked component data.
Help (see sub menus)	Opens MSA help
About MSA	Displays “About MSA” dialog

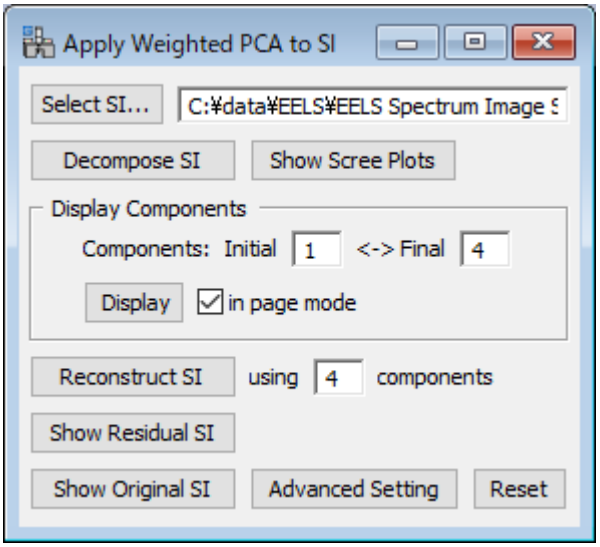
Weighted PCA SubMenu

Component	Description
PCA	Executes Weighted PCA for a whole region.
Show Usage	Show the steps for PCA processing.

Weighted PCA Dialog

The components of the dialog are described below.

Dialog

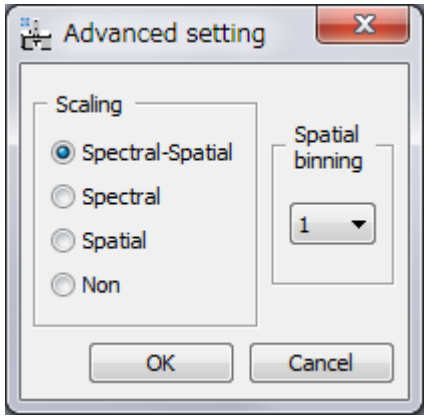


Component	Description
Select SI	Specifies a 2D or 3D SI data file using the file browser.
Decompose SI	Starts decomposing.
Show Scree plot	Displays a scree plot.
Display components	
Initial / Final	Specifies first and last index of components to be evaluated.
Display	Displays components of the selected local region. If “in page mode” is checked, the loadings and scores will be displayed in the page mode.
Reconstruct SI	Starts reconstruction using the specified number of components.
Show Residual SI	Displays the residue of reconstruction.
Show Original SI	Displays the original SI
Advanced Setting	Open advanced setting dialog (see the dialog below)
Reset	Clear inputs

Weighted PCA Advanced setting Dialog

The components of the dialog are described below.

Dialog

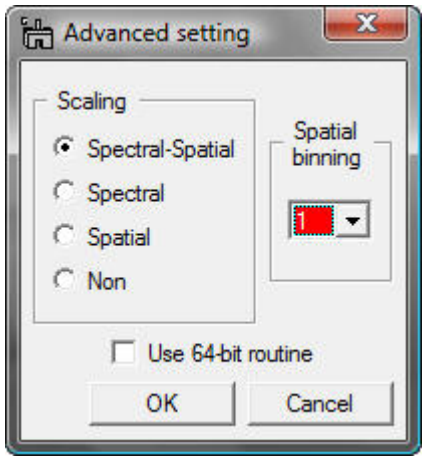


Component	Description
Scaling	Select the scaling mode
Spatial binning	Specifies the spatial binning size.

Weighted PCA Advanced setting Dialog (for GMS 1.x)

The components of the dialog are described below.

Dialog



Component	Description
Scaling	Select the scaling mode
Spatial binning	Specifies the spatial binning size.
Use 64-bit routine	If checked, the 64-bit module will be used. (This is only valid for GMS 1.x.)

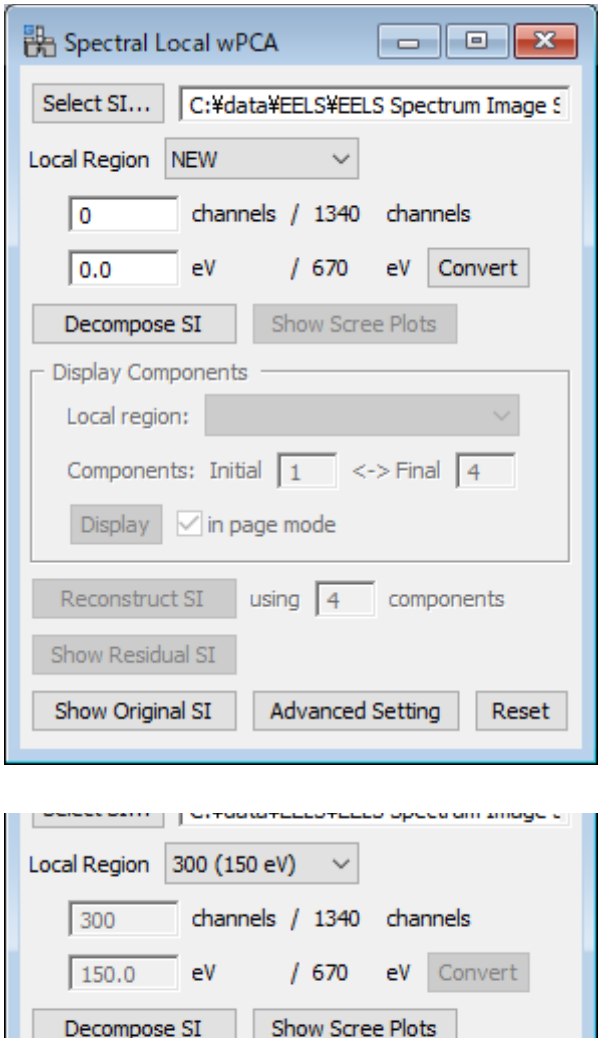
Local wPCA SubMenu

Component	Description
Spectral Local wPCA	Executes Weighted PCA for each spectrally local region.
Spatial Local wPCA	Executes Weighted PCA for each spatially local region.
Show Usage	Show the steps for PCA processing.

Spectral Local wPCA Dialog

The components of the dialog are described below.

Dialog

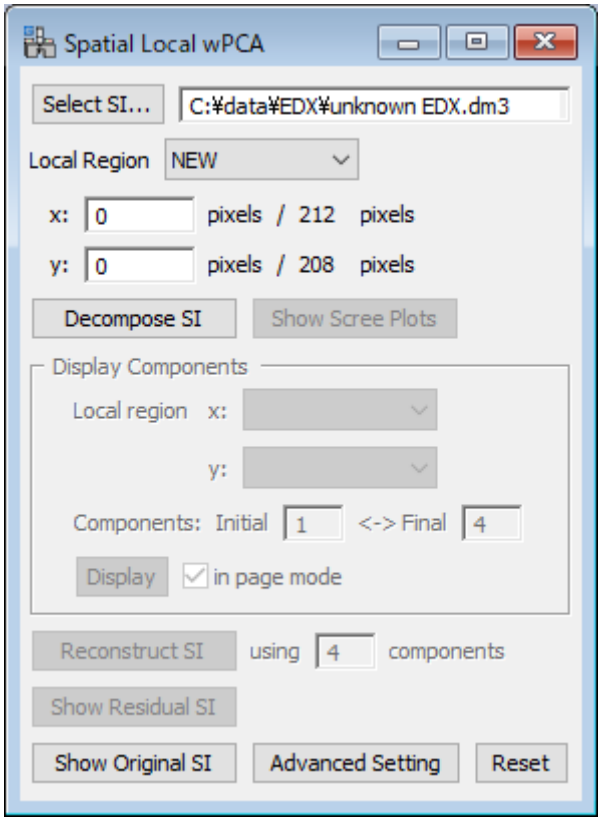


Component	Description
Select SI	Selects a 3D SI data file using the file browser.
Local Region	You can select an existing decomposed result from the pull-down, or select NEW to calculate a new result.
channel/eV	For a new calculation you can specify an energy range of the spectrum in channels or eV. In the case of the existing data the channel and eV are read from the data.
Convert	Convert the energy range between channels and eV.
Decompose SI	Starts decomposition of all the local regions.
Show Scree Plot	Displays all the scree plots.
Display Components	
Local region	Selected a local region to display.
Components	Specifies the first and last index of components to be evaluated.
Display	Displays components of the selected local region. If “in page mode” is checked, the loadings and scores will be displayed in the page mode.
Reconstruct SI	Starts reconstruction using the specified number of components.
Show Residual SI	Displays the residue of reconstruction.
Show Original SI	Opens the original SI
Advanced Setting	Open advanced setting dialog (same as regular PCA)
Reset	Clear inputs

Spatial Local wPCA Dialog

The components of the dialog are described below.

Dialog



Component	Description
Select SI	Selects a 3D SI data file using the file browser.
Local Region	You can select an existing decomposed result from the pull-down, or select NEW to calculate a new result.
x/y	For a new calculation you can specify x and y pixel range of the SI data. In the case of the existing data the x and y pixel range are read from the data.
Decompose SI	Starts decomposition of all the local regions.
Show Scree Plot	Displays all the scree plots.
Display Components	
Local region	Selected a local region to display.
Components	Specifies the first and last index of components to be

	evaluated.
Display	Displays components of the selected local region. If “in page mode” is checked, the loadings and scores will be displayed in the page mode.
Reconstruct SI	Starts reconstruction using the specified number of components.
Show Residual SI	Displays the residue of reconstruction.
Show Original SI	Opens the original SI.
Advanced Setting	Open advanced setting dialog (same as regular PCA)
Reset	Clear inputs

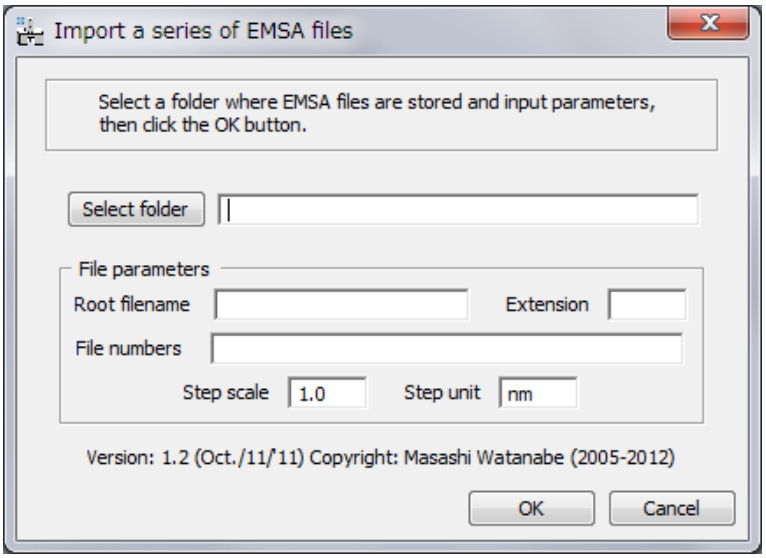
Import SubMenu

Component	Description
EMSA Spectrum File Series	Imports an SI data from EMSA spectrum file series (a line profile (1D scan data).
XED-SI Data	Imports an SI data from XED-SI Data.
EFTEM Image Series	Imports an SI data from EFTEM Image Series.

EMSA Spectrum File Series Dialog

The components of the dialog are described below.

Dialog

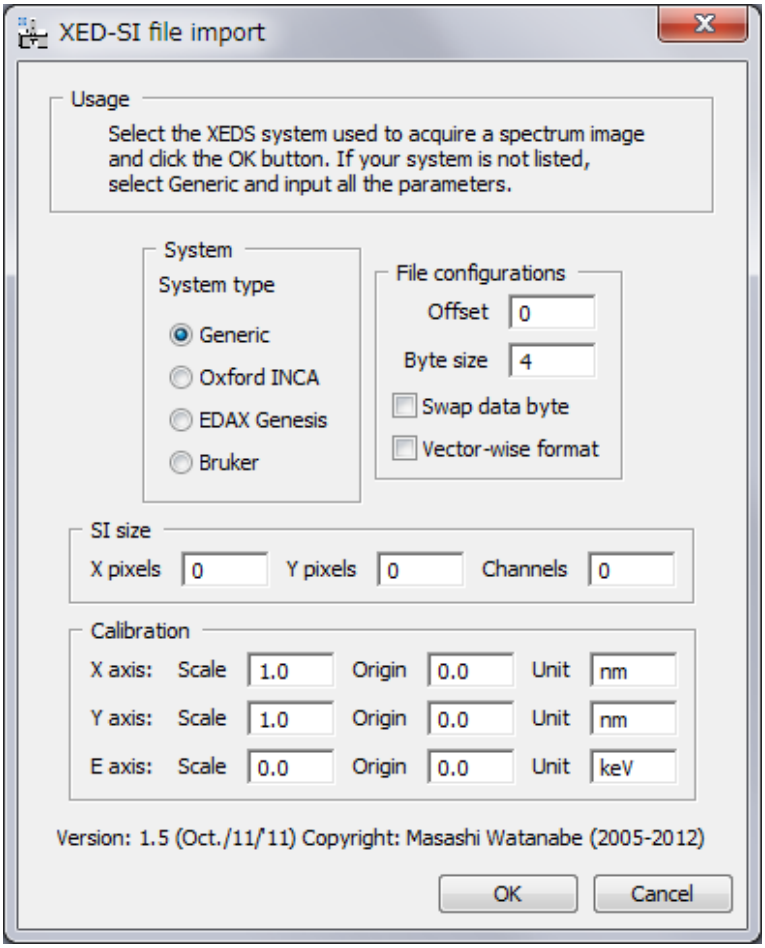


Component	Description
Select folder	Specifies the folder where EMSA formatted file is saved.
File parameters	Parameters for input files
Root filename	The root file name (foo of foojjj.ext).
Extension	The extension (ext of foojjj.ext).
File numbers	List of index numbers t (jjj of foojjj.ext).
Step scale	The scan step size.
Step unit	The scan step unit (nm or angstrom).

XED-SI Data Dialog

The components of the dialog are described below.

Dialog

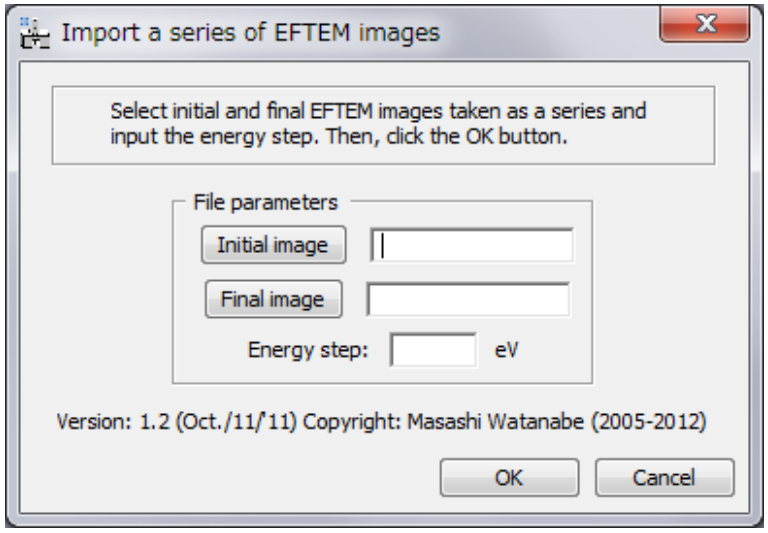


Component	Description
System	Select the system type or Generic.
File configurations	Specifies the format of files to be imported. (If the input is not required then it will be gray out.)
Offset	Offset in byte before the data starts.
Byte size	Size of each data value in byte.
Swap data byte	If selected, the data byte order is swapped.
Vector-wise format	If selected, each spectrum has been saved sequentially in the file.
SI size	
X pixels / Y pixels	Number of the image pixels along x-axis / y-axis
Channels	Number of data channels for spectrum.
Calibration	
X axis / Y axis / E axis	Specifies Width / Height / Energy (Spectrum) axes
Scale	Scale of each pixels or channels
Origin	Starting value of each axis
Unit	Unit of Width / Height / Energy (Spectrum) axes

EFTEM Image Series Dialog

The components of the dialog are described below.

Dialog



Component	Description
File parameters	
Initial image	Select the first image using the file browser. (All the images should be in the same folder)
Final image	Select the last image using the file browser. (All the images should be in the same folder)
Energy step	The energy step value in eV between the images.

Bin SI Dialog

The components of the dialog are described below.

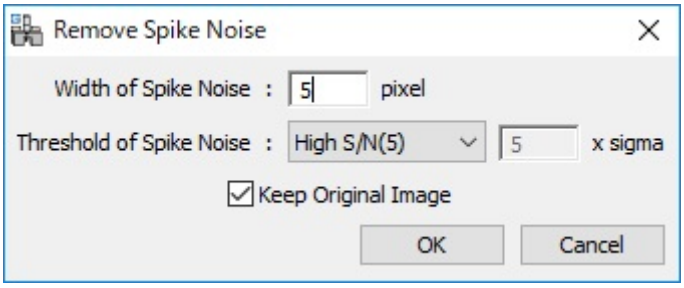
Dialog

Component	Description
Spatial	Bins an SI data with a selected binning factor along x and y directions.
Spectral	Bins an SI data with a selected binning factor along an energy channel.

Remove Spike Noise Dialog

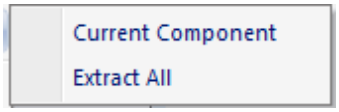
The components of the dialog are described below.

Dialog



Component	Description
Width of Spike Noise	The spike noise is searched within this range of pixels
Threshold of Spike Noise	The data point that exceeds this noise level is recognized as the spike noise, and replace by the local average.
Keep Original Image	When checked, the original image is kept intact, and new image is created.

Extract component(s) SubMenu



Component	Description
Current Component	Extract the current component data (loading and score) from a stacked component data. (The front image must be a stacked component data)
Extract All	Extract all component data (loading and score) from a stacked component data. (The front image must be a stacked component data)

Help SubMenu

Component	Description
Manual	Displays the manual in pdf format.
Command Reference	Displays the Quick Reference Guide in chm format.