

New Features of xHREM v3.6 (Windows/Mac OS)

1. STEM: 64-bit OS support

STEM Extension Pro supports 64-bit OS: Windows XP, Vista, Windows 7 and Mac OS X. With the Extension Pro you can handle a memory space more than 4 GB (Each application of a 32-bit OS can handle roughly 2 GB.) Thus, you can handle more phase gratings (namely, larger non-periodic model) than ever. Most of STEM simulation of an ideal crystal may be carried out by using a normal STEM Extension (32-bit version).



MultiGUI / STEM Extension / Option Tab

2. STEM: Cluster computing support

STEM Extension Cluster support cluster computing. We will supply both 32-bit and 64-bit versions for both Windows and Mac OS X. Since STEM simulation requires a heavy number crunching, the cluster computing will be a rational choice. If you have already more than single license, you can use a corresponding version of STEM Extension Cluster without any surcharge. Especially, a 32-bit STEM Extension Cluster will accelerate an ideal crystal simulation effectively.

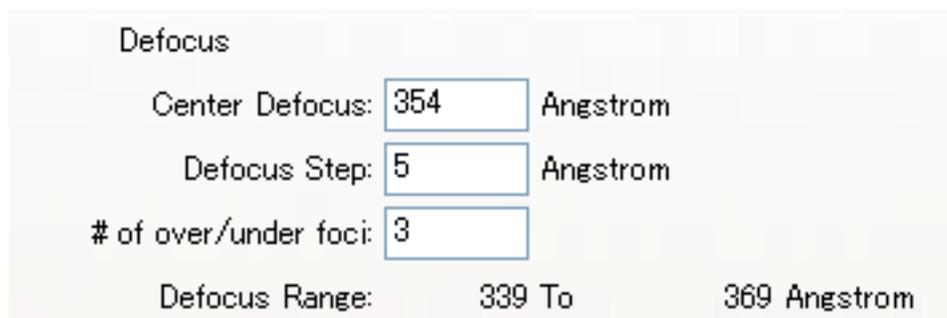


MultiGUI / STEM Extension / Option Tab

3. STEM: Partial coherency handling

Partial coherency of STEM image due to a defocus spread and a physical probe size can be handled by xMultiGUI/STEM Extension and xSTEMImage.

The defocus-spread effect is emulated as a weighted sum of intensities of different defocus simulations, which will be performed easily with the following control:



Defocus

Center Defocus: 354 Angstrom

Defocus Step: 5 Angstrom

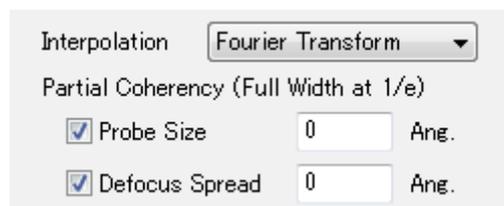
of over/under foci: 3

Defocus Range: 339 To 369 Angstrom

MultiGUI / STEM Extension / Basic Tab

NOTE: The physical probe size effect (under implementation) will be emulated as a weighted sum of intensities of neighbor calculation points.

Actual effect of partial coherency due to a probe size and defocus spread can be evaluated by xSTEMImage. Here, Gaussian distributions are assumed for both the probe size and the defocus spread, and a full width at 1/e value is specified.



xSTEMImage

4. xSTEMImage: New image intensity interpolation method

You can select one of the two interpolation methods (Fourier Transform/Bi-linear Interpolation) to estimate intensity between the calculated points. Usually, an interpolation using Fourier transform gives smoother image. Thus, a wider step (scan distance) can be used in calculation and a computation time may be substantially decreased.

5. CBED: 64-bit OS support

CBED Extension Pro supports 64-bit OS: Windows XP, Vista, Windows 7 and Mac OS X. With the Extension Pro you can handle a memory space more than 4 GB (Each application of a 32-bit OS can handle roughly 2 GB.) Thus, you can use up to 16k x 16k diffraction points that is 16 times diffraction points handled by a 32-bit version.



MultiGUI / CBED Extension / Option Tab

6. xImageGUI: Fifth order spherical aberration and Zernike Phase plate

You can specify the coefficient of the fifth order spherical aberration as well as a phase shift due to Zernike phase plate. The specified phase shift will be applied in the area inside of the inner aperture.

7. 3D numerical data output for DigitalMicrograph

Since DigitalMicrograph does not currently support the 3D tiff format, we have implemented the gfx format (Gatan) for a 3D numerical output of raw data. Thus, you can analyze a 3D raw data quantitatively using DigitalMicrograph.