TEM - TFS Titan Krios G3i: Check-list before starting data acquisition.

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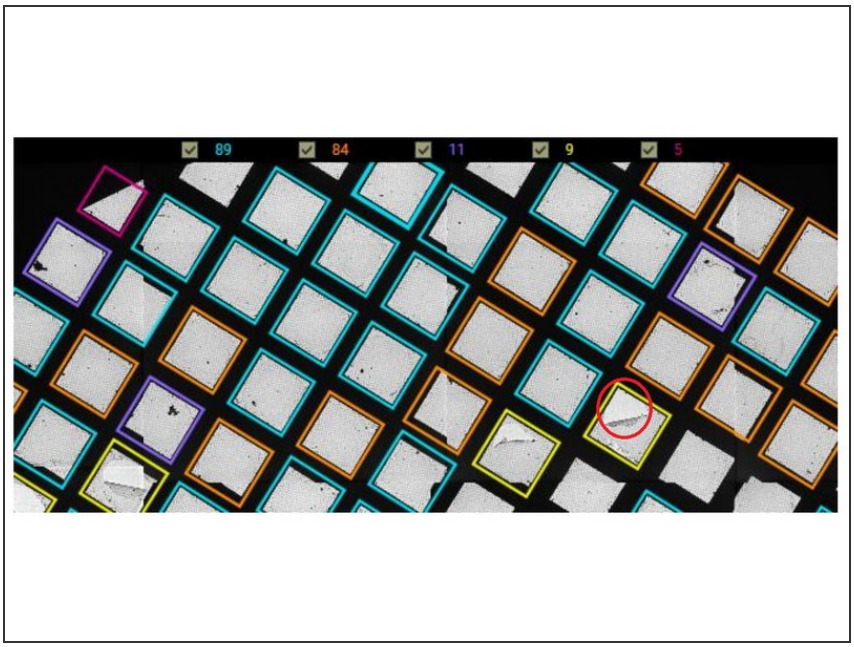
INTRODUCTION

Overview of the direct alignments to be done before starting data acquisition at the transmission electron microscope Titan Krios G3i.

Please find more detailed information about the system here.

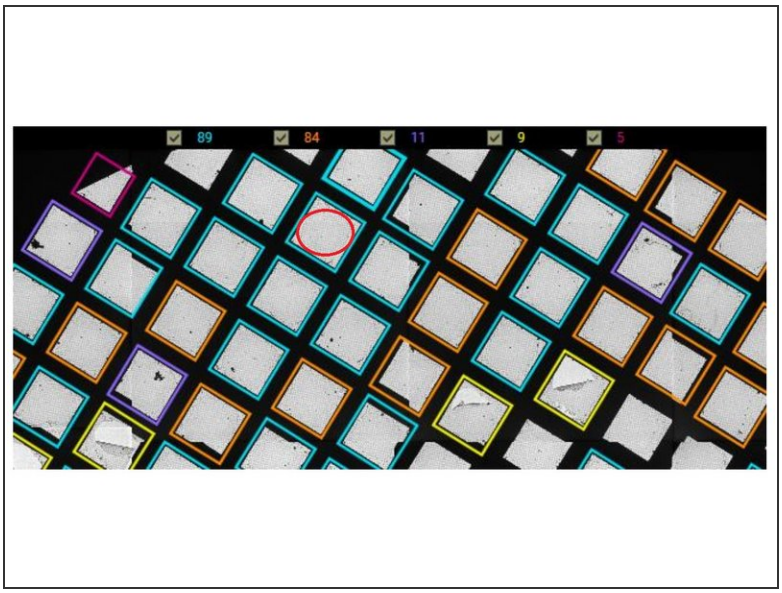
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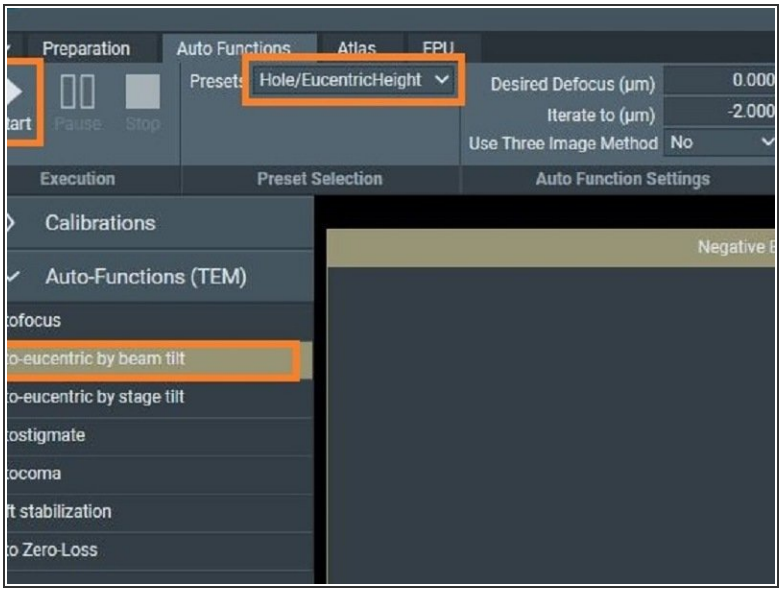
Step 1 — Gain Reference and Energy Filter Tuning



- Before data acquisition perform energy filter tuning and acquire a gain reference. Do the same always after microscope and Camera cryocycle (i.e. on Monday Morning) and after a Camera Power Off/Power On cycle.
- Navigate to a void position like a broken grid square, or remove the grid if no voids are available on the grid.
- Prepare the gain references (instructions here).
- Tune the energy filter (instructions here).

Step 2 — Eucentric Height



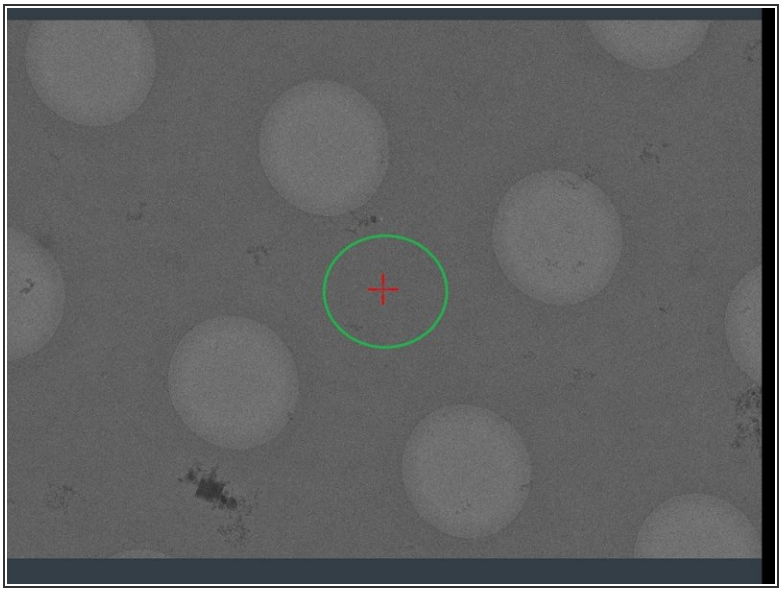


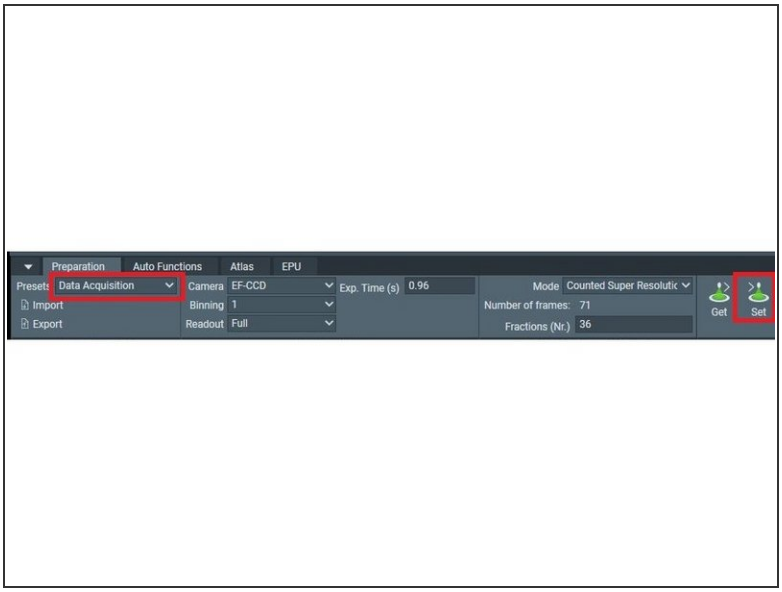
ⓘ The Titan Krios G3i is super stable, only minor alignments are needed before starting data acquisition.

⚠ Do all the alignments with the objective aperture out, and insert it only before starting data acquisition (step 6).

- Move the stage to a thin area of carbon.
- Adjust eucentric height using the EPU autofunction, if you wish, with the "Hole/Eucentric Height" Presets.

Step 3 — Focus

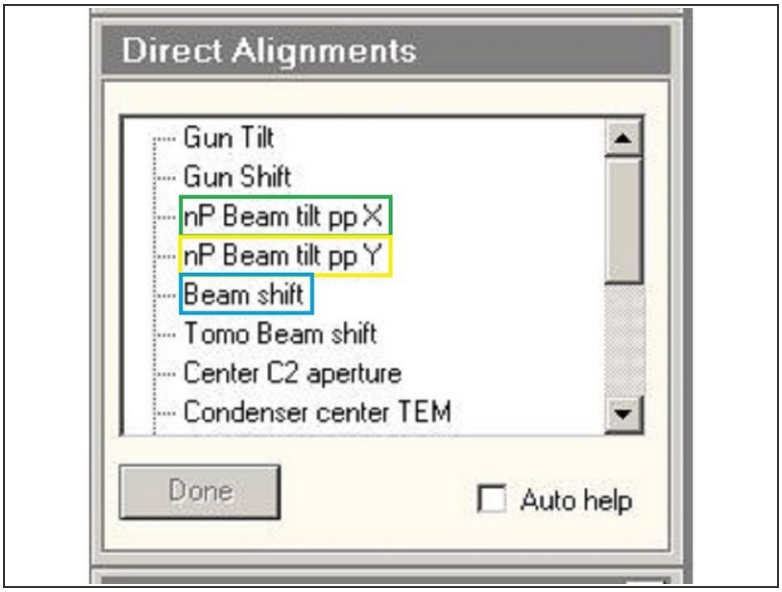




- Make sure you are on carbon, checking the stage location with a Hole/Eucentric Height preview. If you are not, move the stage by right click on a carbon location in the preview image, and selecting "move here".
- Set the data Acquisition Presents to the microscope.
- Bring the Sample to focus condition. Adjust with the focus knob using Thon rings: select into Digital Micrograph: "Process -> Live FFT" and adjust until you don't see any Thon Rings.

Step 4 — Direct Alignments: pivot points and beam shift

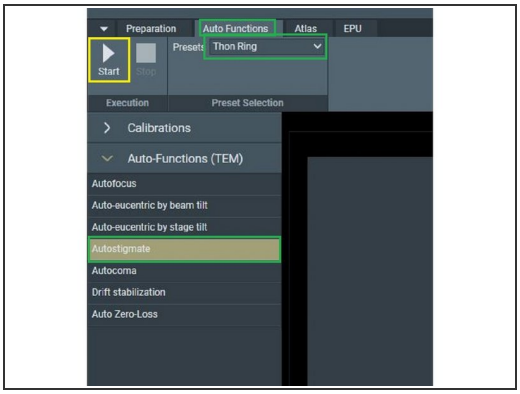


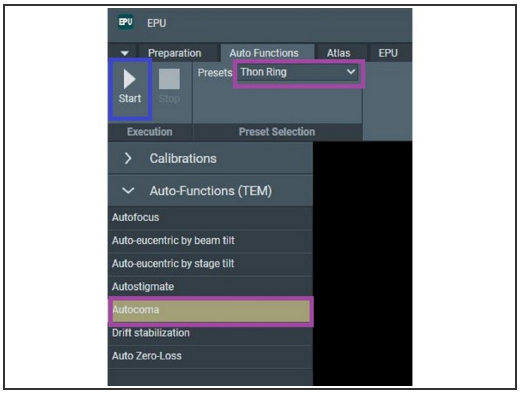


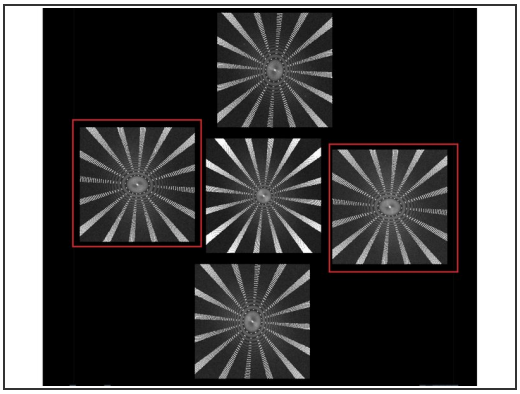
ⓘ Once in focus, proceed with the Direct Alignments.

- The direct alignements are done on the fluoscreen, insert the screen by pressing R1, on the right microscope control panel.
- Activate the pivot point X. Use the **Multifunction X** to you minimize the beam movement.
- Activate the pivot point Y. Use the **Multifunction X** to you minimize the beam movement.
- Center the beam with the beam shift. Use both Multifunction X and Y to center the beam to the K3 position (indicated on the fluoscreen with the green circle)

Step 5 — Direct Alignments: astigmatism and comma free alignments



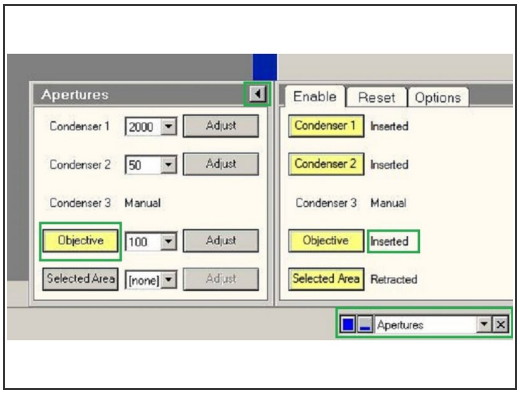




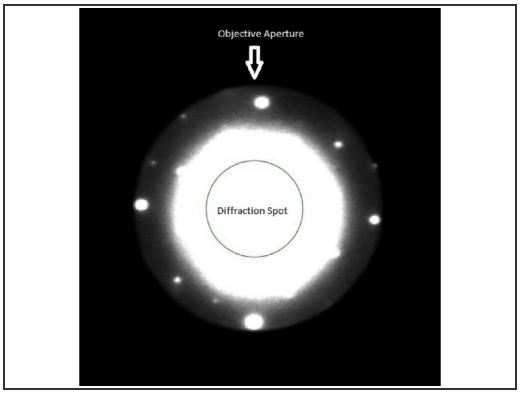
ⓘ You can correct for the astigmatism and comma free alignments with the EPU Autofuction.

- In the AutoFunction tab of EPU, select "Thon Ring" as presets, for the Autostigmate function.
- Start the calibration.
- For the Autocoma, in the same tab select the Autocoma function, and keep the "Thon Ring" presets.
- Start the calibration.
- The coma free alignment is successful when the defocus of both positive and negative beam tilt on the same axis stay the same. The example shows the 2 images from the positive and negative beam tilt along the x axis, presenting the same defocus.

Step 6 — Insert the Objective Aperture

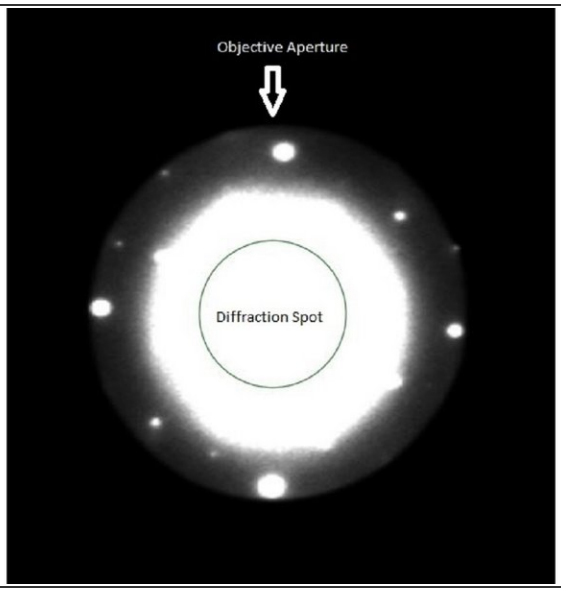


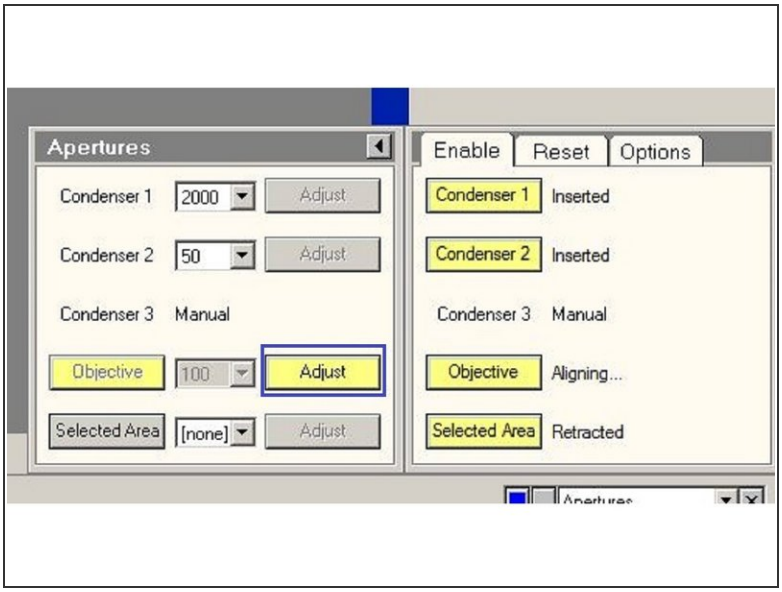




- Insert the objective aperture using the Microscope User Interface (TUI). Click the arrow to display if the objective aperture is inserted. Insert it by clicking on "Objective" button.
- Switch on the diffraction mode on the right microscope control panel.
- Insert the Fluoscreen (R1).
- To observe the objective aperture, click on the image and change the intensity of the live view on the fluoscreen with wheel of the mouse.

Step 7 — Center the objective aperture

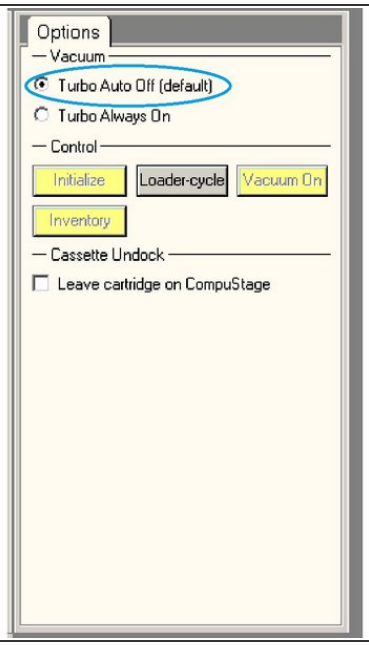




ⓘ The objective aperture needs to be centered to the diffraction spot.

- Select "Adjust" on the aperture tab, and center the aperture using the Multifunction X and Multifunction Y wheels.

Step 8 — Turbo pump AutoOff



- Make sure that the Turbo pump is set Turbo to Auto Off (otherwise the vibration would affect your data).

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