

## Improve productivity with Fringe-Free Imaging (FFI)

### Increase the throughput for select Thermo Scientific Cryo-TEMs

With typical optical alignment, the C2 aperture of the microscope induces Fresnel fringes at the edge of the beam that illuminates the specimen. These fringes cause artifacts and unusable areas for data collection. When the electron beam is set to illuminate a larger area than necessary to prevent fringes, usable areas in the foil hole are sacrificed through radiation exposure.

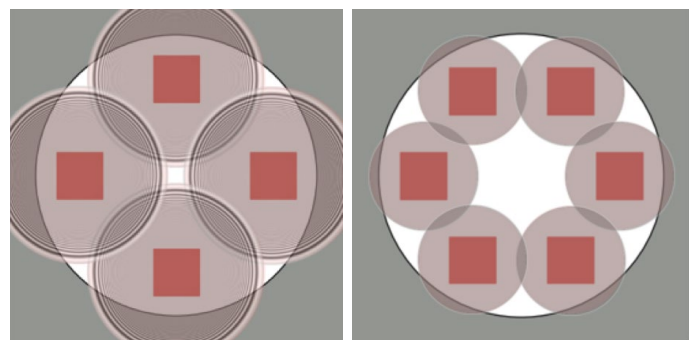
Fringe-free imaging (FFI) is a new optical alignment that eliminates the Fresnel fringes at the edge of the beam. It minimizes the illuminated area and damages less sample, allowing more images to be captured within a single foil hole.

#### Benefits:

- **Increased throughput:** allows more images to be collected per hour.
- **Increased yield:** allows more images to be captured within a single foil hole, and less foil holes are needed.

FFI is part of the standard configuration of the latest generation Krios and Glacios Cryo-TEMs. An FFI upgrade is now available for the Thermo Scientific™ Krios G2, Krios G3, Krios G3i, Talos Arctica and Glacios Cryo-TEMs. The Krios G1 Cryo-TEM system can be upgraded if equipped with a third-generation Autoloader\*. With this upgrade, the CompuStage and Autoloader hardware, as well as the lens series, are adapted in such a way that the C2 aperture is focused on the

\*Check the status of your instrument with your local Thermo Fisher Scientific service personnel.



Illustrations compare data acquisition for a single foil hole in non-FFI-corrected (left) and FFI-corrected (right) microscopes. Image areas are represented by the square, and illumination areas are represented by the surrounding circle. Fringes are clearly visible on the image on the left, while not visible in the image on the right.

specimen and the fringes are virtually eliminated. Note that the microscope must be running Windows 7 or Windows 10.

The productivity of the cryo-TEMs is further enhanced by data collection schemes using image/beam shift, implemented as aberration-free image shift (AFIS) in Thermo Scientific EPU Software and third-party data acquisition software. The latest generation direct electron detectors, like the Thermo Scientific Falcon 4i Direct Electron Detector, benefit significantly from the presence of FFI and AFIS, boosting overall single-particle analysis productivity depending on the use case. For more information on use case throughput specifics, see our FFI Technical Notes for Krios Cryo-TEMs ([thermofisher.com/krios-ffi](https://thermofisher.com/krios-ffi)) and Glacios Cryo-TEM ([thermofisher.com/glacios2-ffi](https://thermofisher.com/glacios2-ffi)).

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