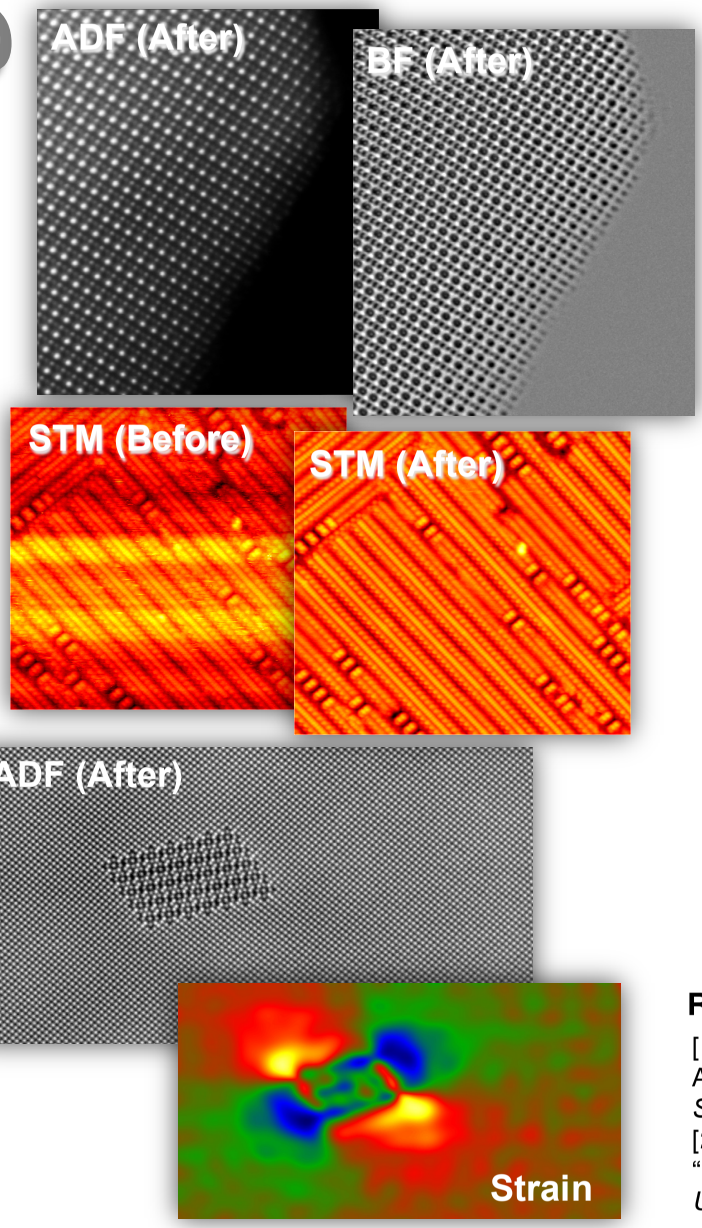
SmartAlign

DigitalMicrograph Plug-in

"SmartAlign" Scan-distortion Compensator

Rigid & Non-rigid Image Registration



SmartAlign corrects for stage-drift and scan-distortion using fast multi-frame image acquisition [1], and improves resolution, strain-precision [2], signal-to-noise ratio, and image-intensity distribution while reducing beam damage effects.

Image-drift causes scans to appear sheared, and non-linear scan-distortions deforms image intensity distribution. The SmartAlign will effectively counter both of these effects, and deliver the images that can be further analyzed quantitatively, say for composition and strain.

Key Features

- Intuitive and interactive workflow for efficient image registration.
- Correction of image offsets, linear drift and non-linear distortion.
- No prior sample knowledge nor symmetry assumption required.
- Correction of distortions across multiple signals, e.g. ADF/ABF.
- Automatic motif search and stacking (template matching).
- Support for multi-frame spectrum-image to increase SNR.
- Support for digital super-resolution mode.
- Custom options included for TEM, STEM, STM/AFM.

References:

[1] L. Jones, H. Yang, T.J. Pennycook, M.S.J. Marshall, S. Van Aert, N.D. Browning, et al., "Smart Align—a new tool for robust non-rigid registration of scanning microscope data", *Advanced Structural & Chemical Imaging* **1**:8 (2015) doi:10.1186/s40679-015-0008-4.
[2] L. Jones, S. Wenner, M. Nord, P.H. Ninive, O.M. Løvvik, R. Holmestad and P.D. Nellist, "Optimising Multi-frame ADF-STEM for High-precision Atomic-resolution Strain Mapping", *Ultramicroscopy*, **179** (2017), doi:10.1016/j.ultramic.2017.04.007.

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