

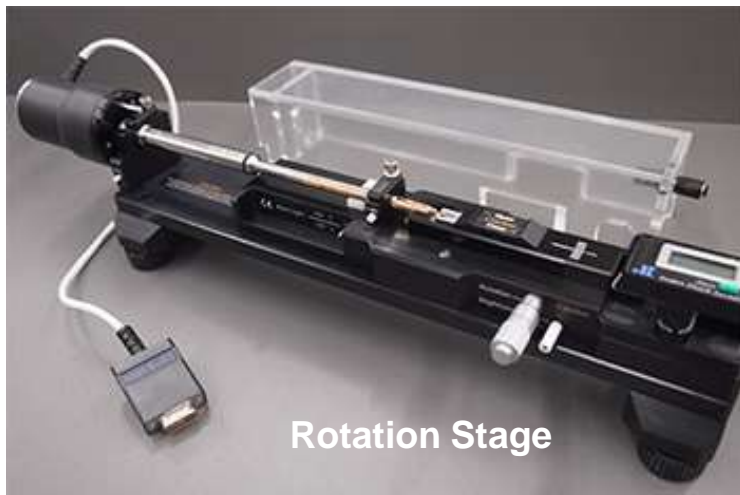
Application Notes

HATA-Holder System

— 3 Axis EDS Tomography Holder —

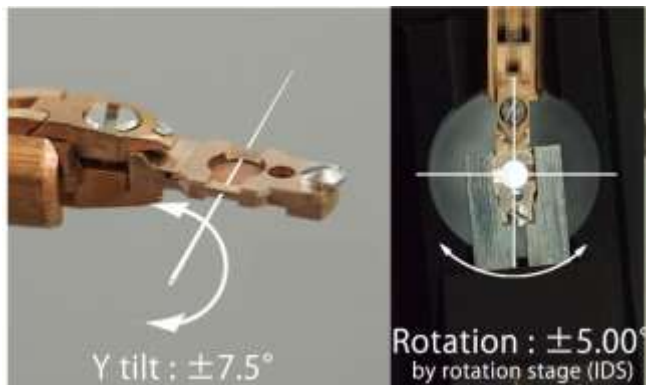
Product Summary

Holder

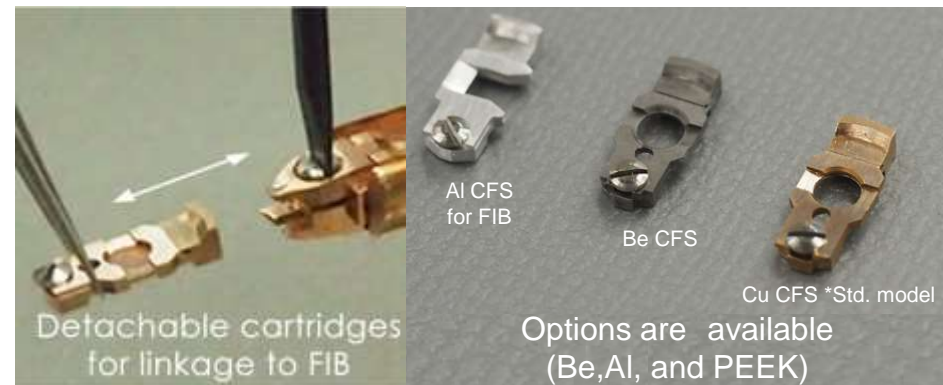


Basic Item(Recommended package) *Additional options are available

Triple Axis . Index Dock System



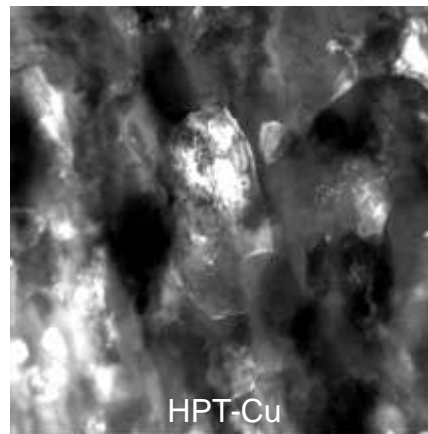
Cartridge(CFS)



Specification

●Mechanism	: Triple Axis /Tomography / EDS / Linkage System
●X tilt	: ± 80 Degrees (limited by Gonio Stage condition.)
●Y tilt	: ± 7.5 Degrees.
●Rotation range	: ± 5 Degrees. *Controlled by IDS(Index Dock System)
●Minimum step control of angle	: 1/100 Degree
●Cartridge links	: FIB, SEM, APT

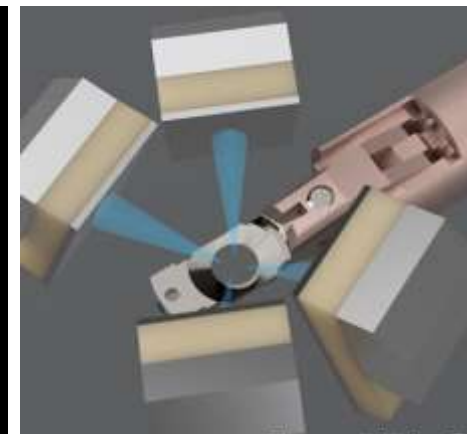
Perfect Alignment
Crystal Orientation



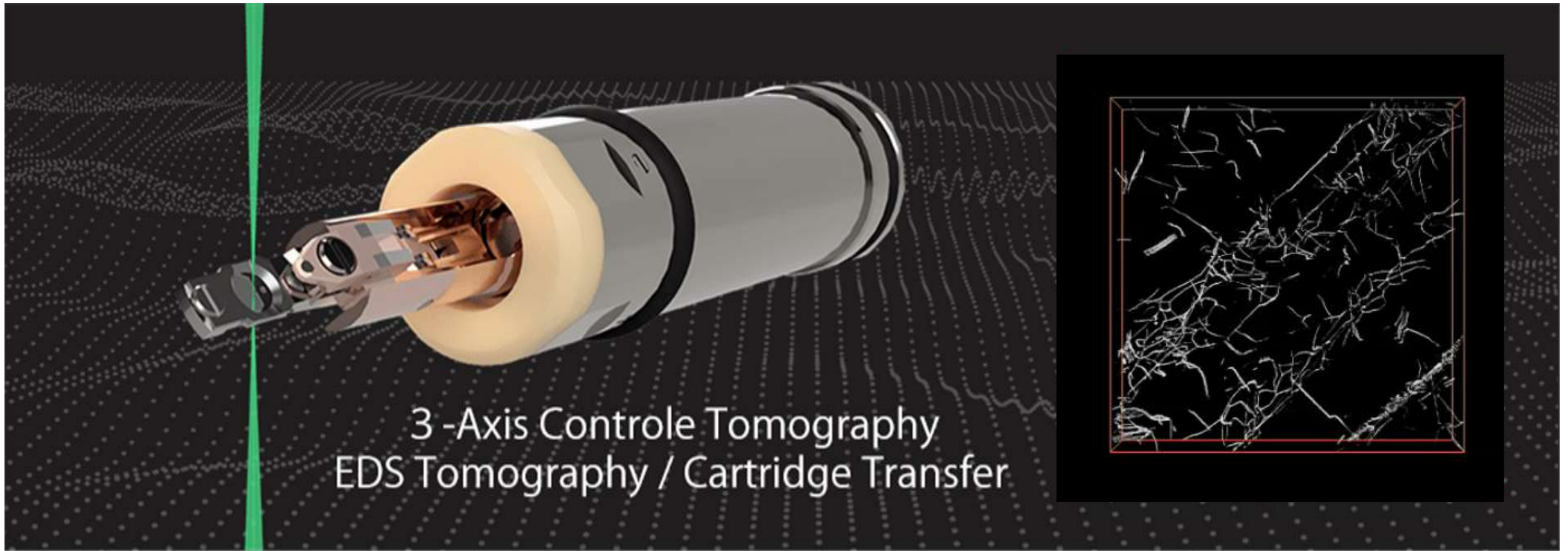
Good 3D imaging



Free from X-ray shadowing



3-Axis orientation alignment Tomography



Y tilt: $\pm 7.5^\circ$ + Rotation: $\pm 5^\circ$
Crystal Orientation Alignment by these 2 axis



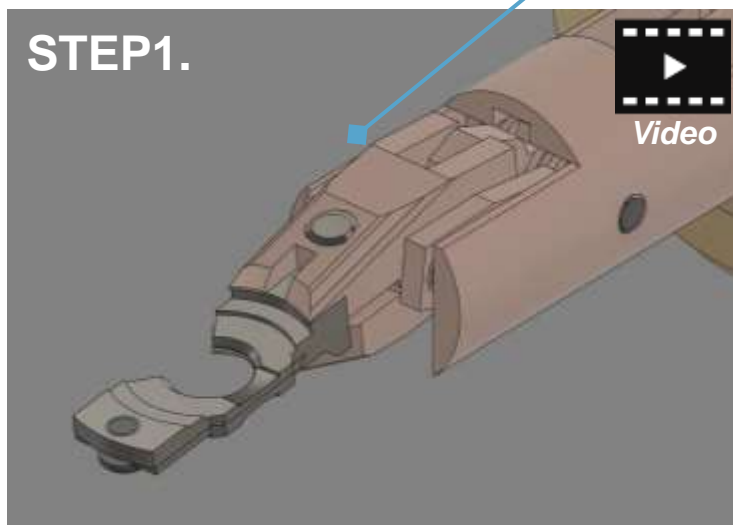
X tilt: $\pm 80^\circ$
Great 3D imaging

Hata, Mitsuhashi *et al.*: Ultramicroscopy (2011)

How to use the rotation stage

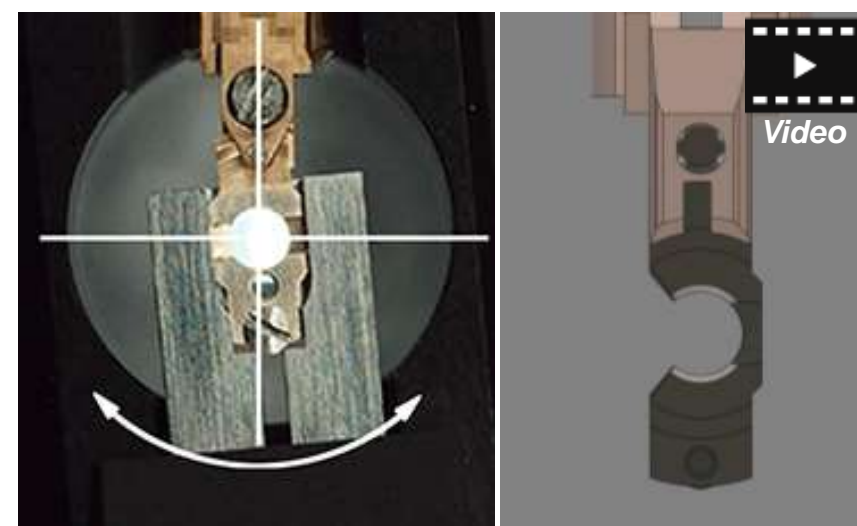
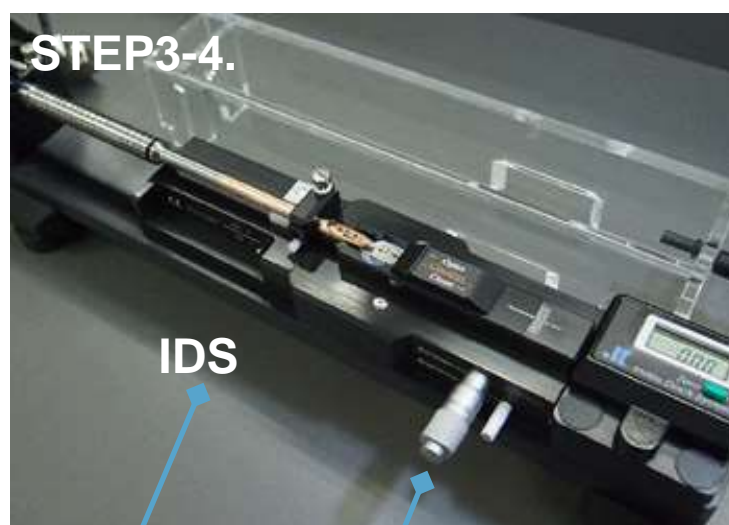
STEP1.

Align crystal orientation use by 2nd tilt(Ytilt) in-seat TEM.



STEP2.

Find out how many more rotations the crystal orientation will align by diffraction pattern in TEM



STEP3.

Remove from TEM then set on our Rotation Stage.(IDS)

STEP4.

Rotate using the micro rotation knob(Resolution 0.01°).
*You can see it on the digital display.

STEP5.

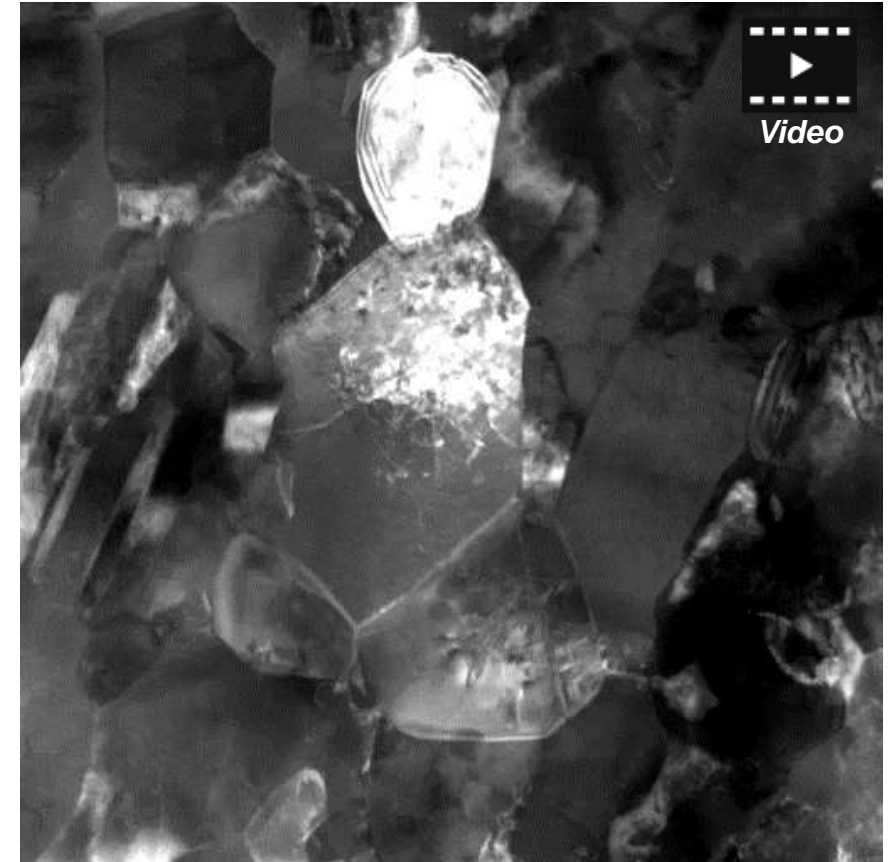
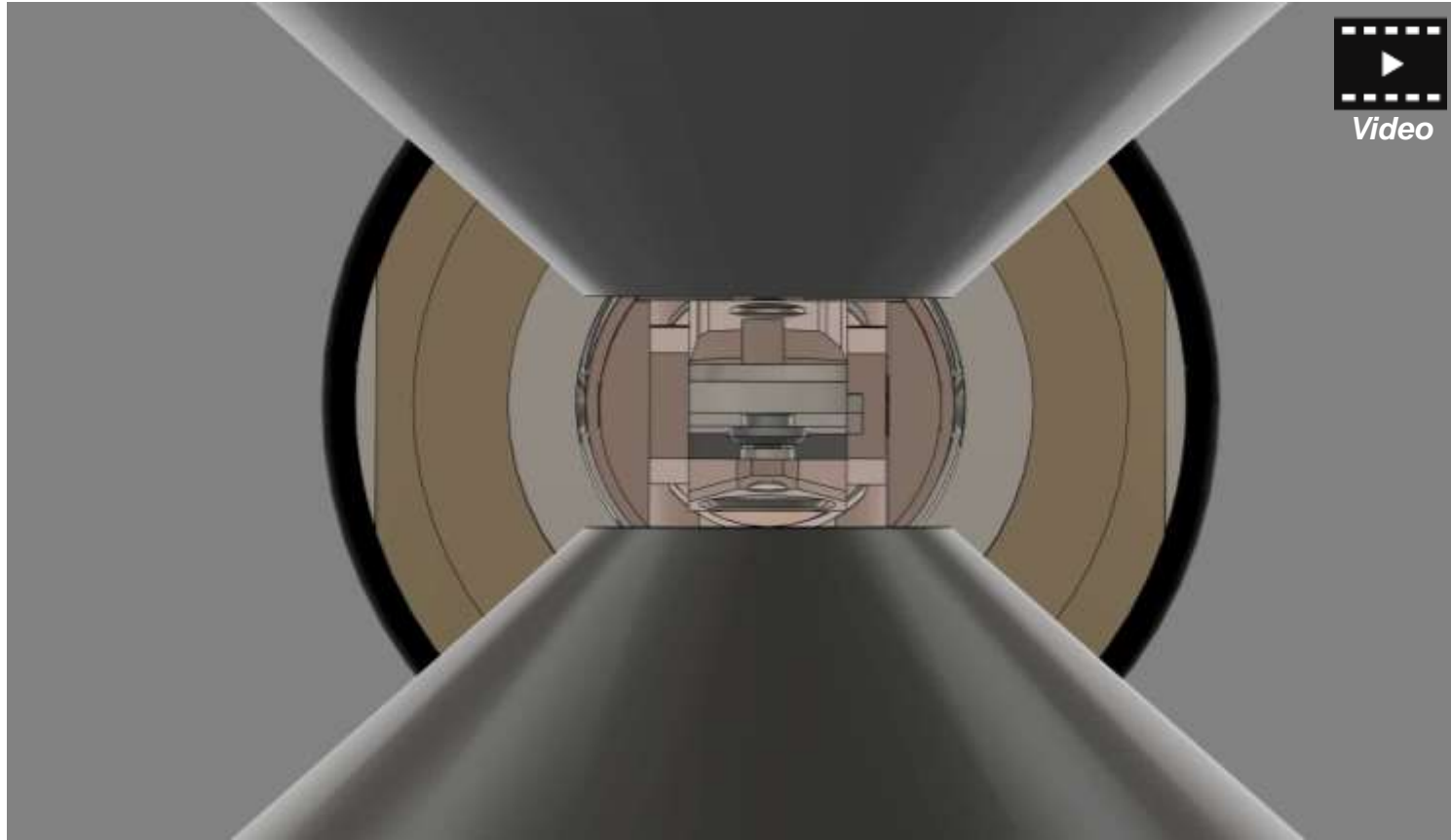
Then insert TEM and crystal align it by Y-tilt.

Let's try Tomography

Y tilt: $\pm 7.5^\circ$ and Rotation: $\pm 5^\circ$
(Crystal Orientation Alignment)

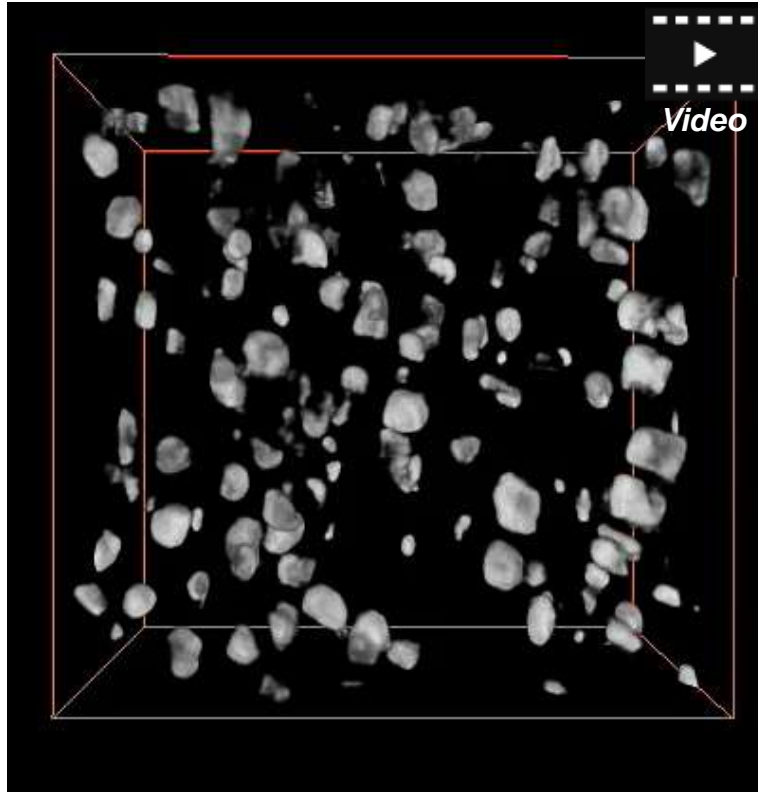


Get the great 3D imaging With Perfect Orientation Alignment by these 2 axis

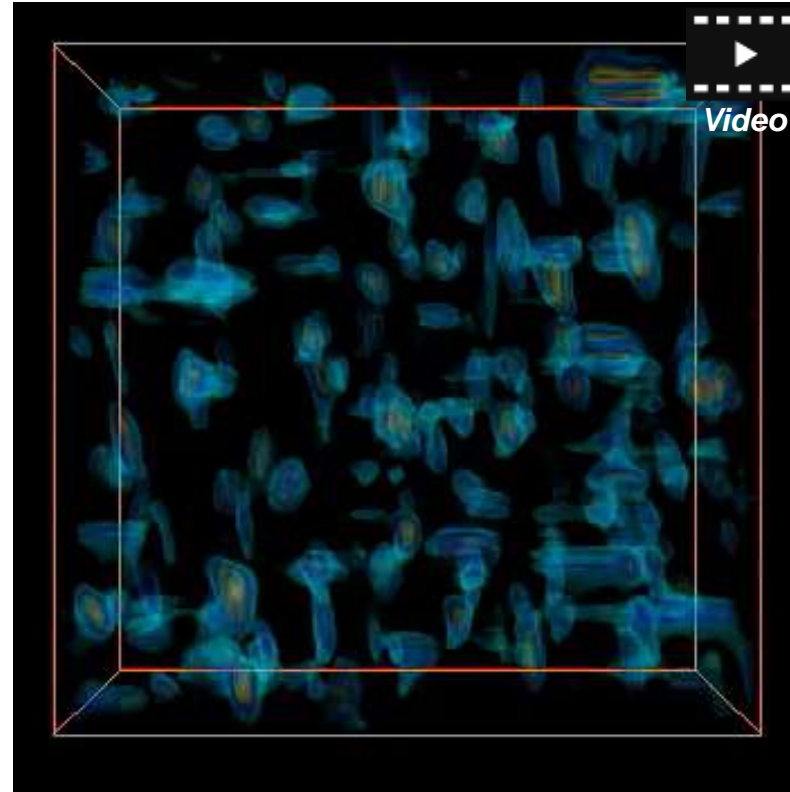


Some Tomography data

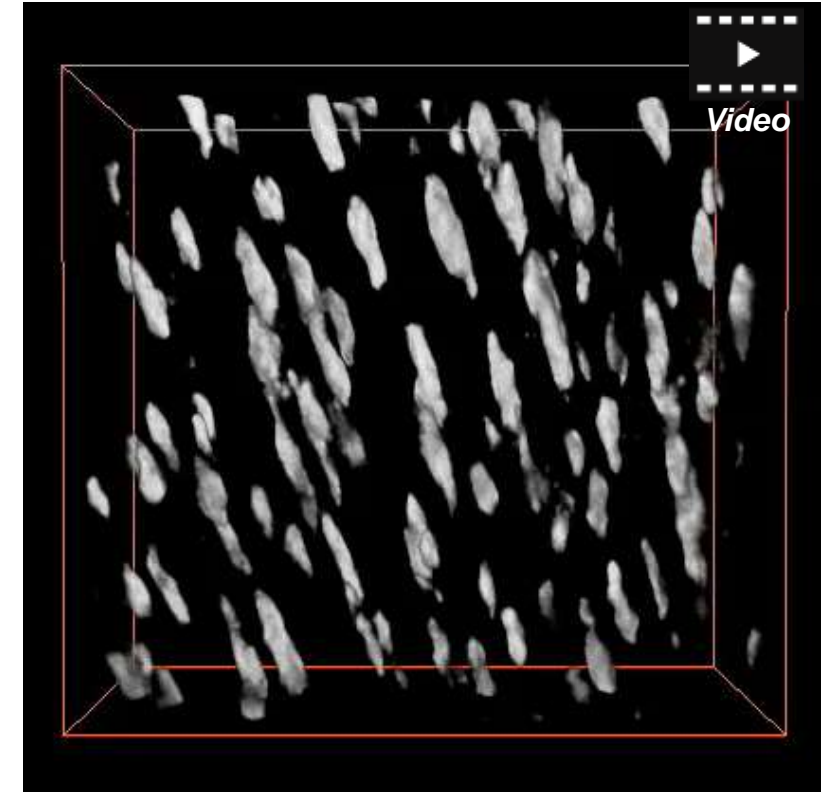
Ti-6.25 at% Fe, 673 K-36 ks



Al-Mg-Si



Ti-25 at% Nb, 573 K-36 ks

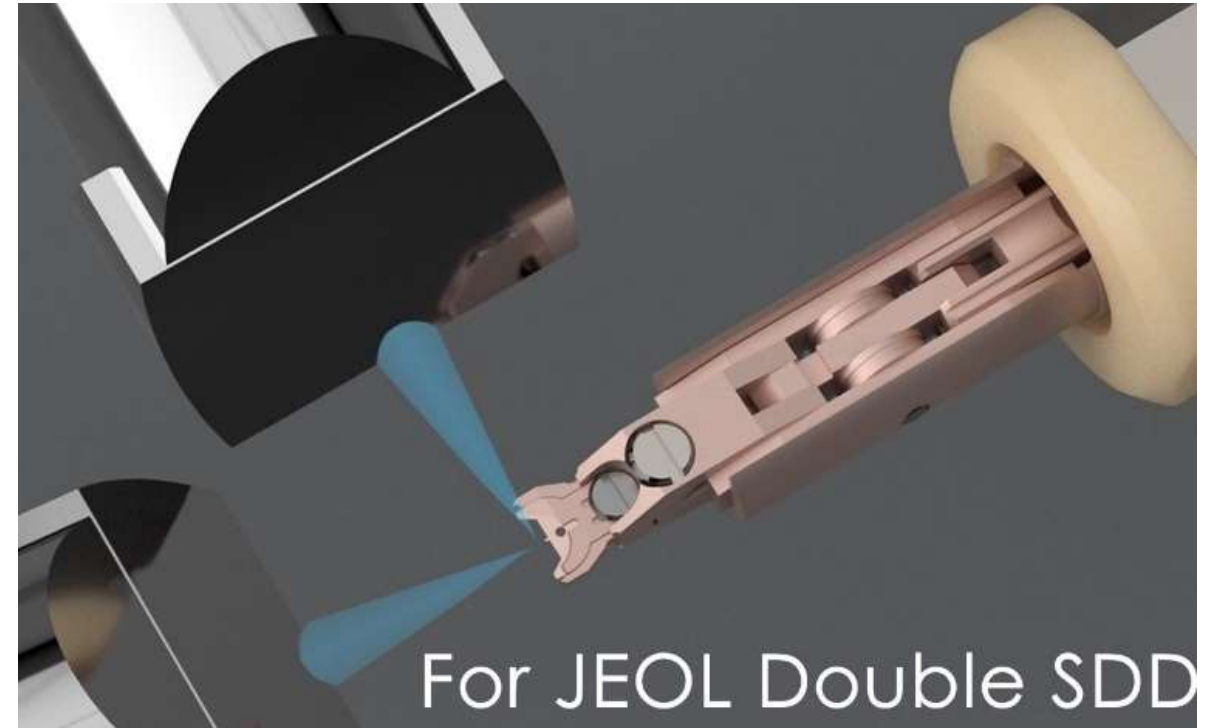
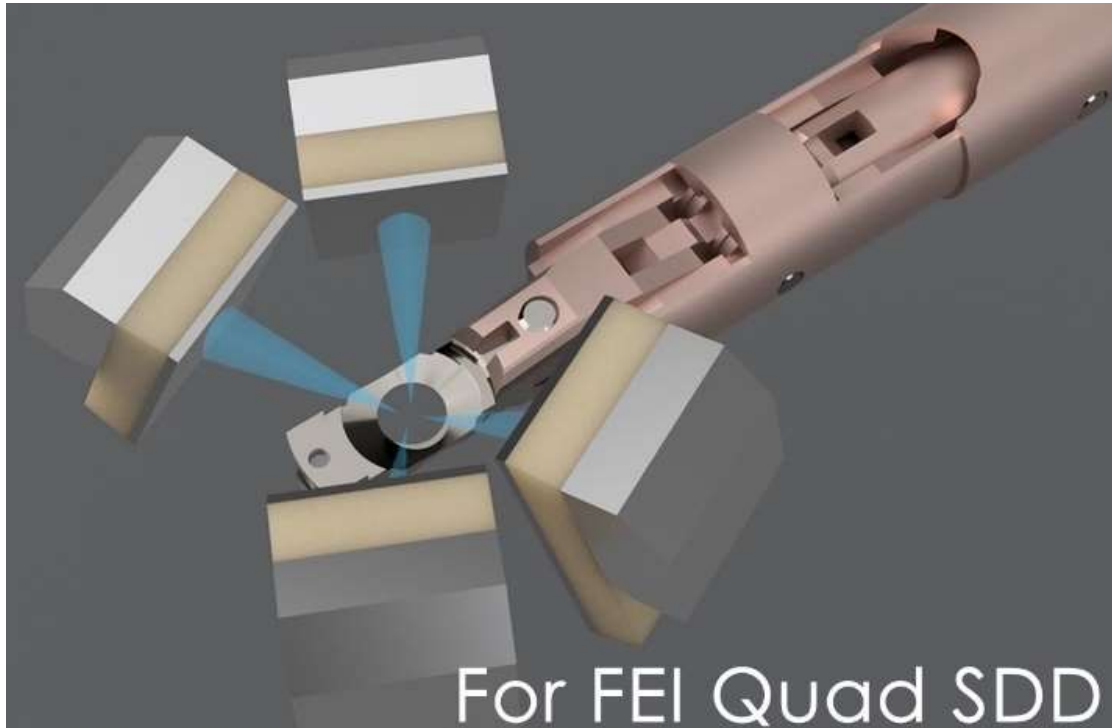


Provision of data

Mitsuhara & Nishida,
Kyushu University

Why high detection efficiency?

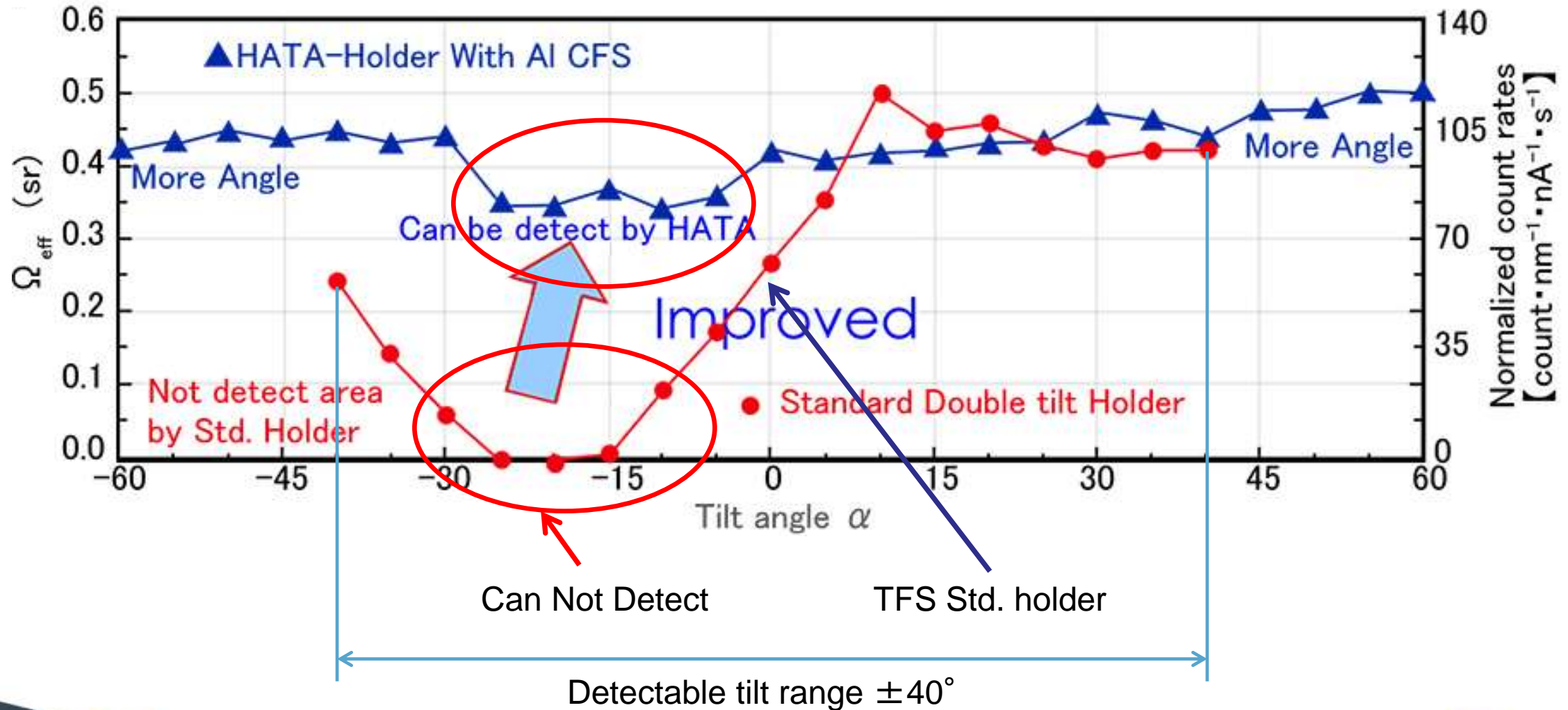
There is no obstruction in front of the EDS detector



Very advantageous design for FEI multi SDD and JEOL Double SDD

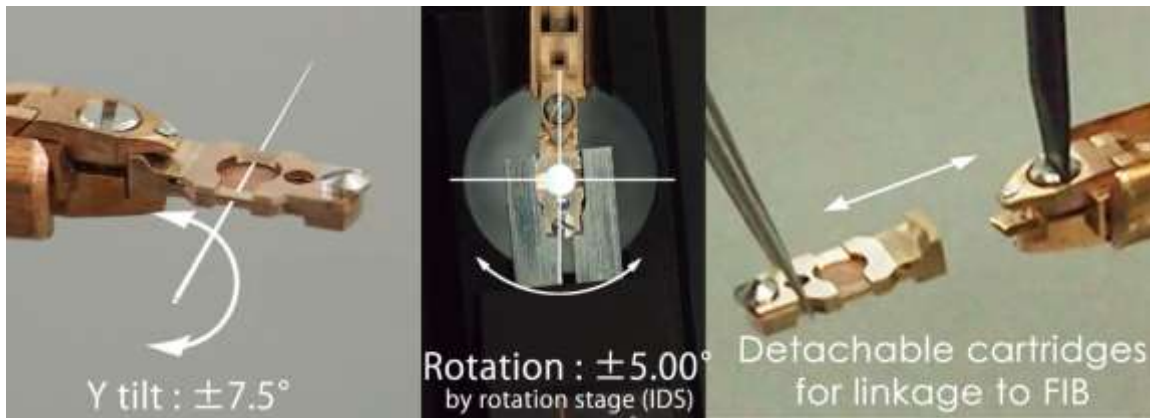
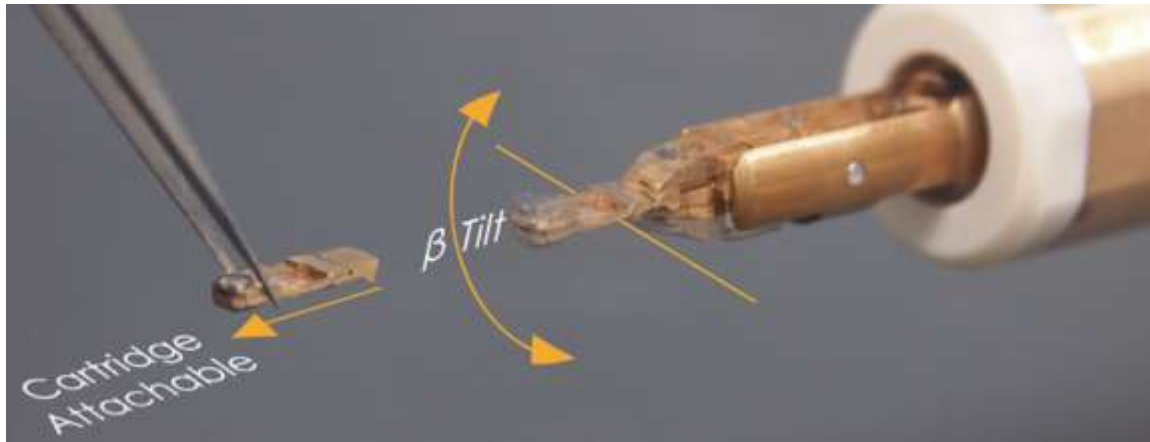
Great Performance of EDS analysis

High efficiency Triple tilt EDS Tomography



Easy Cartridge Structure

Detachable cartridges for linkage to FIB,SEM,APT

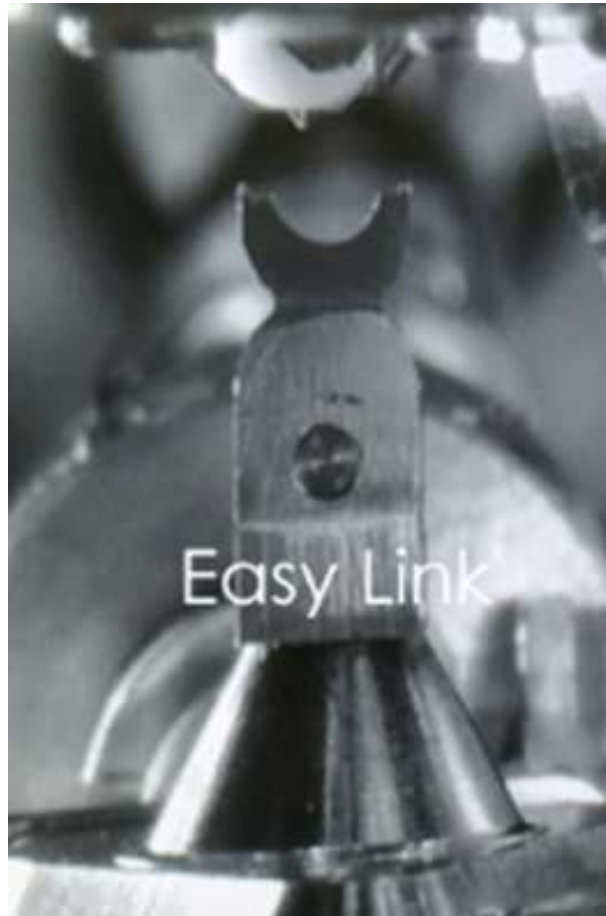


Only Mel-Build can be realized
Cartridge link solution with Double Tilt



Double tilt cartridge structure-1

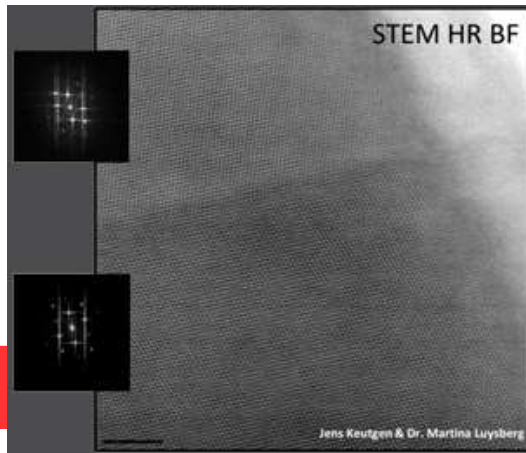
It can be linked with other Tool.



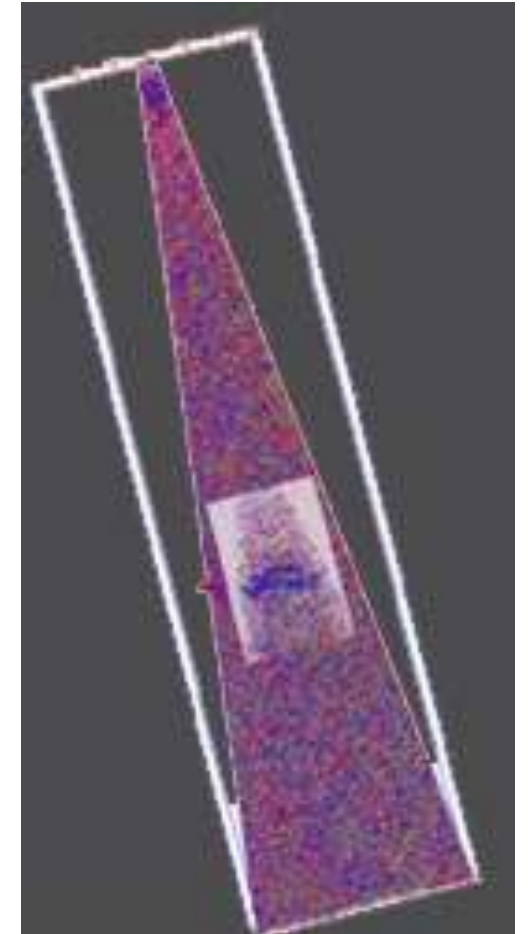
TEM Tomography



HR STEM image



ATP Tomography

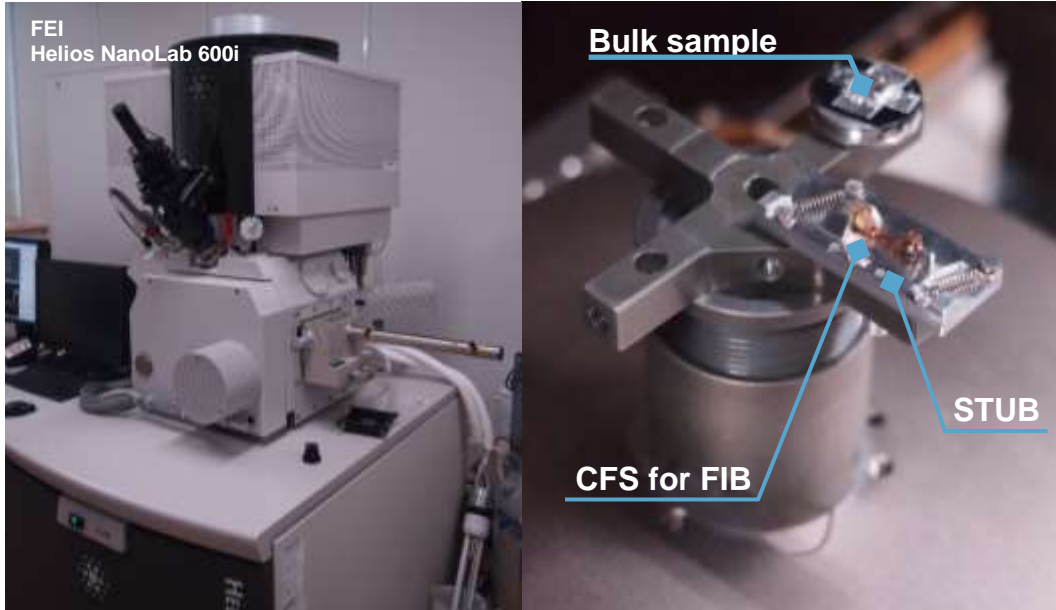


Double tilt cartridge structure-2

How to set CFS in the holder after FIB processing.

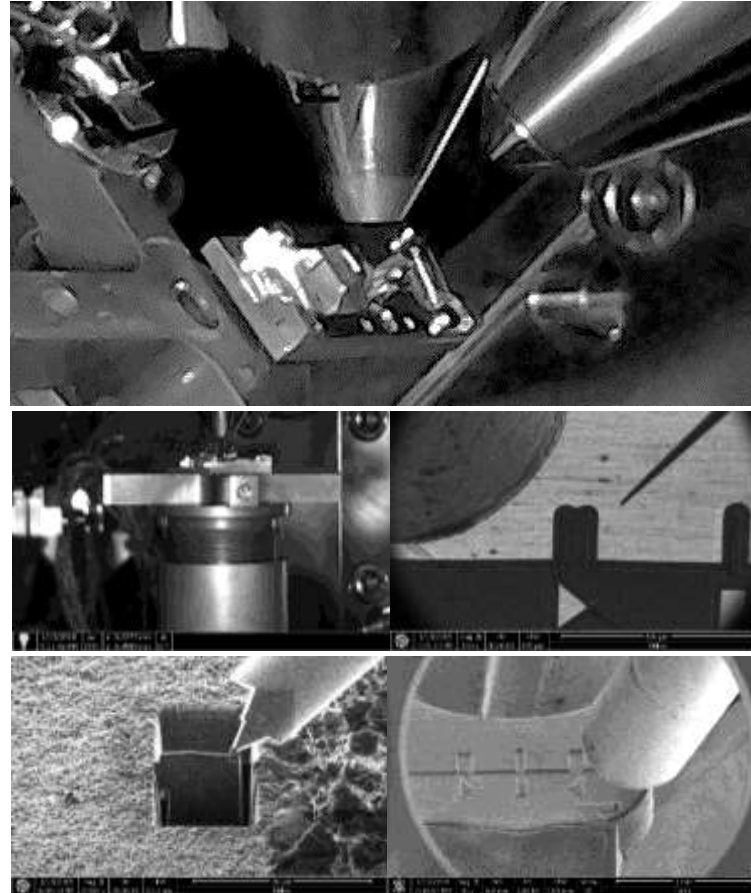
STEP1.

Set CFS as shown in the picture below.



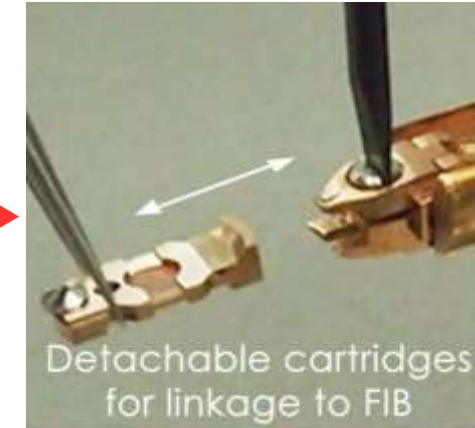
STEP2.

The samples are made in several steps.



STEP3.

Installing CFS.



There are other Useful uses of this CFS.

Details on the next page.

The CFS is no hits with stage tilting.



It was cut off at this line for the safety.



Double tilt cartridge structure-3

It can be linked with other Tool.

Cartridge and STUB



Go to FIB

Atom probe
and other apparatus

Go to Atom probe



Application Notes

Double tilt Needle Holder

— Tomography Holder —

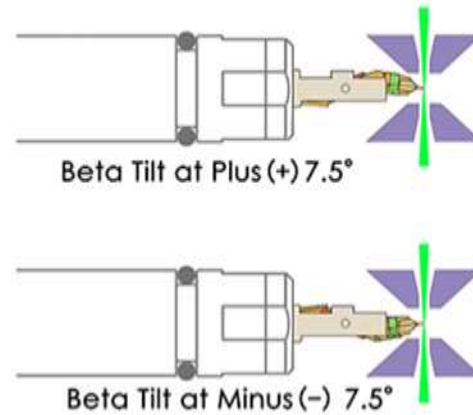
Product Summary



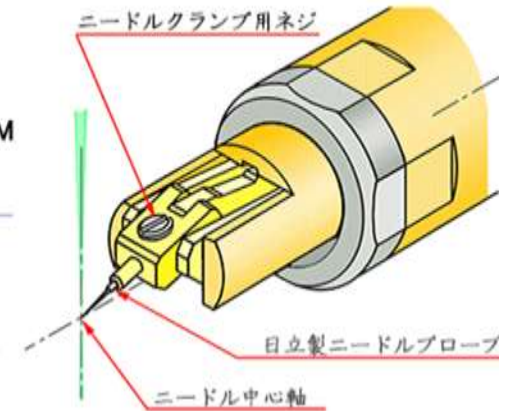
Original Tweezers for Needle

Specification

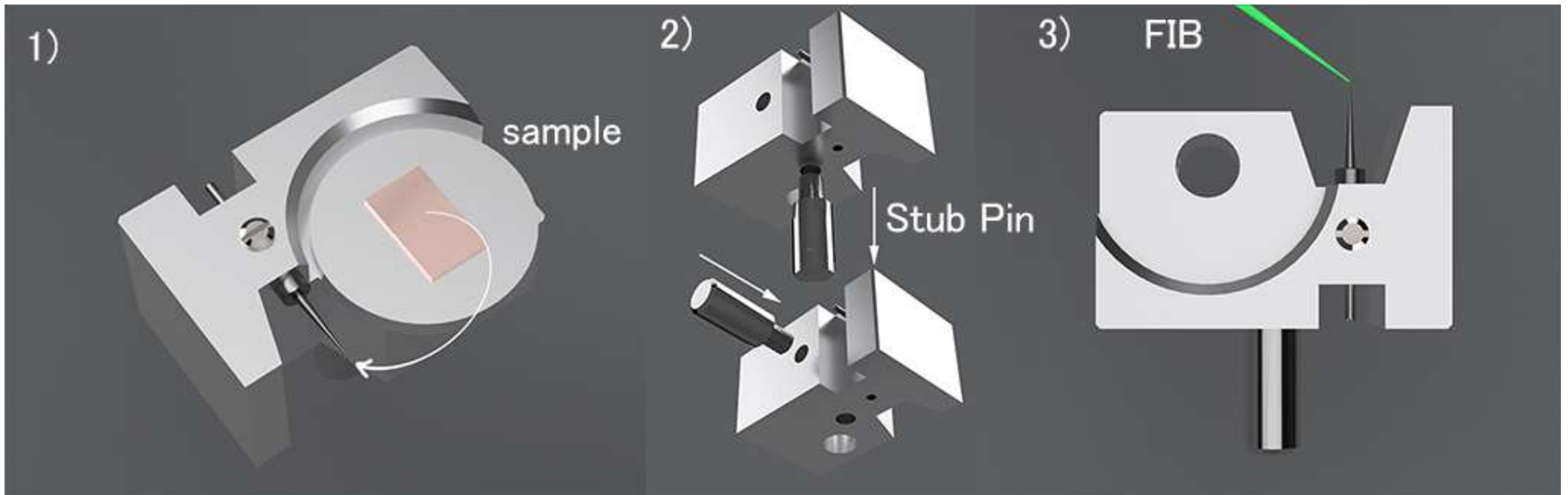
- **Double tilt Needle**
- Agar AP300/400 tips for in-situ tip change
- Hitachi micro probe
- X tilt : ± 90 degree
- Y tilt : ± 7.5 degree
- Virtual Pivot movement
- Control by TEM (motor drive)
- ARM-UHR compatible



Virtual pivot™
The virtual pivot concept image.



Example of sample preparation method with FIB by our STUB



- 1) Place the section cut out with the FIB on the needle.
- 2) Remove the STUB pin and fix it again to the position rotated 90 degrees.
- 3) Finish the sample section with FIB.

Easy link to other tools (FIB/SEM APT Gentle Mill and More)

